

## NEWS IN BRIEF

### US may ease AT&T path

THE US government's Federal Communications Commission is proposing moves which would make it easier for AT&T to compete with Satellite Business Systems and others in the data communications market.

The moves involve a change in the 1958 consent agreement between the Justice Department and AT&T which precludes the latter from entering any data processing business. The Justice Department is, however, opposed to any change in the consent agreement without strict attention to AT&T, principally the sale of the Western Electric manufacturing subsidiary.

### ICL's graduates

THE first 30 non-white students to graduate from ICL South Africa's training school for programmers and operators received their certificates from ICL managing director Dr Chris Wilson in Johannesburg this month.

### Link-up delay

OVERTIME ban by the Post Office engineers is contributing to a delay in linking the Newcastle University Multiple Access Computer system with an IBM 370/168 and 360/67, to the network that links London University computers.

### Standard parts

FOR the sake of standardisation, British Leyland has decided to stop using NCR's PCMI Ultra-fiche for its car parts catalogues in favour of standard 48X microfiche produced on COM. This will allow one reader to be used for different companies' catalogues.

# COMPUTER WEEKLY

## Question on race may be cut from census

THE next census, in 1981, will contain a question asking people their race, according to current government proposals. Health Minister Roland Moyle said, however, that the question might be dropped if there was a public outcry against it.

The recently published White Paper on the census affirms the importance of maintaining security of the central computer system that will process the census data, but it says the government reserves its

position on implementing the BCS' suggestion that there should be independent monitoring of processing centres.

Before taking any decisions in this area the government will wait for the report of the Data Protection Committee, which is already very late. No names and addresses will be entered on the computer.

Patricia Hewitt, of the National Council for Civil Liberties, said that a question on race would only be acceptable if it was tied

to a positive programme for improving housing, etc. It would be preferable if it was made one of a set of optional questions, as otherwise many people would be reluctant to answer it and would then face prosecution, she said.

The question would have to be carefully phrased to avoid confusing race with religion, she added. Also, it must be the respondent and not the census-taker who decides what race he is.

## US may block sale to Soviets

A SMALL Univac 1100 miniframe wanted by the Soviet News Agency, Tass, last week became a pawn in the power play between the US and Soviet governments. Tass journalists covering the Moscow Olympics in 1980; but the US government is considering blocking the sale in protest against the jailing of Soviet dissidents who tried to monitor implementation of the Helsinki agreement on human rights.

Sources close to the White House say that active consideration is being given to refusing an export licence for the Univac machine but that no decision has yet been

It is understood that a final decision will be made after President Carter returns from the economic summit meeting in Bonn. Nevertheless, Robert Byrd, majority leader in the US Senate has been quoted as saying that the sale has been blocked — at least temporarily.

Despite the speculation surrounding the fate of the order, Univac itself has heard nothing. "We are having to read about it in the Press," commented a spokesman at the European office in London, which is responsible for Eastern bloc sales.

"We have heard nothing official either way from the Department of Commerce. If the sale has been blocked, it would be a departure from normal procedure for the decision to be released generally before we were informed. We are in the position of interested bystanders."

Univac has already waited almost a year for the Department of Commerce to grant an export licence for the machine. The contract, for a small 1100, was placed last September, and as well as the central computer includes concentrators and communications subsystems.

Univac has only sold one other large system to the Soviet Union, an 11081 which will handle International Reservations for Aeroflot.

## Secrets Act reforms

THE government has decided not to introduce a Freedom of Information Bill at present, but will propose some reform of the Official Secrets Act, the Prime Minister told the House of Commons. A White Paper setting out the government's reasons for this and the changes envisaged to the controversial Section Two of the Official Secrets Act is expected this week.

A Freedom of Information Bill, as advocated by various backbench MPs, would make all government files and data banks open to the public, with certain specified exceptions. Mr Callaghan said he regretted that the government could not introduce such a Bill, but he was gratified that government departments were acting on his suggestion to make more material public.

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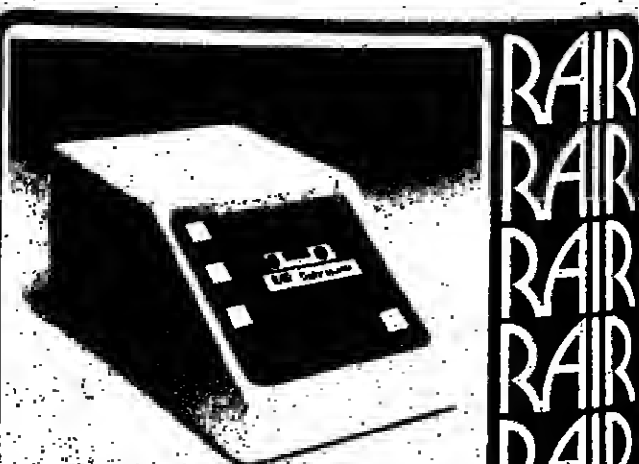
### Joseph visits Redifon

Shadow Industry Secretary Sir Keith Joseph officially opened the factory at Crawley, Sussex, where Redifon Computers aims to produce 50 of its R-range distributed processing systems each month (CW, April 13). Sir Keith is seen here discussing configuration test equipment with Redifon Computers' managing director Roffen Keyes.

## NCR rejects voluntary ballot on staff union

AFTER months of discussions NCR has rejected the proposal that there should be a voluntary ballot of its staff to see if they want ASTMS to represent them (CW, October 27, 1977). The union is now to press its claim that it should be the negotiating body for all the appropriate grades in the company and the Advisory, Conciliation and Arbitration Service will carry out a formal ballot. At present ASTMS represents 800 NCR field engineers.

Commenting on the company's refusal to agree to a voluntary ballot Jim Mercer, ASTMS' North London divisional officer, said NCR's decision was unfortunate and reflected its attitude towards collective bargaining for its staff.



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## One year's reading progress in 12 hours

NOTABLE success in teaching adults to read has been shown in an experiment using a new package for "basic skills" called Control Data's Plato system. Several hundred "functionally illiterate" people in the US were given reading training on the online terminals, and gained an average one school year's reading level in 12 hours' instruction. Similar success was also shown in maths teaching where 15 years' progress was made in 20 hours.

Functional illiterates, of whom there are estimated to be 23 million in the US now, come from lack of teaching rather than mental handicap.

The Basic Skills Learning System, soon to be released by Control Data, is aimed to provide computer-aided learning people with this kind of difficulty in a variety of subjects. This type of teaching is popular with students. Control Data says, provides motivation, and reduces drop-out rates.

Plato is a special-purpose bureau service provided by Control Data using a network of mainframes in Minneapolis, Chicago, Quebec, and Brussels and special terminals with graphics capability. Customers could be the training departments of industrial companies or universities or schools, or they can either use Control Data's course packages or write their own.



## Briefing Unigate order goes to Univac

THE battle to win the big Unigate order (CW, May 11) has been won by Univac against competition from ICL, which was trying to keep a prestige customer, and IBM. Under the £2.5 million deal Univac is to supply an 1100/12 to Unigate Foods at Trowbridge, Wiltshire, where it will replace two ICL 1004As. The system will include 34 UTS terminal systems which, among other applications, will be used for online program development.

A second phase of the project includes a 30/30 to replace a 1902A and a V77-800, the Univac mini based on Varian designs, to replace a 1801A.

### 400 redundant

ABOUT 400 people at the Texas Instruments factory at Bedford are to be made redundant due to the transfer of some discrete component manufacturing to TI's Plymouth factory. Despite the 20% reduction in its workforce Bedford will still be TI's biggest plant in Europe.

### Tory policy

SET up by Sir Keith Joseph earlier this year (CW, April 20) the Tory party's working group on information technology hopes to have its position paper ready by mid-September. Chairman of the group Ian Lloyd, MP for Havant, told Computer Weekly that the group would spend another two or three weeks taking evidence from specialists, including GEC managing director Sir Arnold Weinstock, before writing the report.

### BCS moves in

THE British Computer Society is expected to move into its new headquarters next week, at 13 Mansfield Street, London W1M 0BP, just around the corner from its existing Portland Place centre. Its telephone number remains the same: 01-637 0471.

### Shorter week

THE Post Office Engineering Union says that the Post Office's five per cent planned reduction in inflation-linked telecommunications costs and speeding up of introduction of System X can only be achieved with its co-operation, and that this will not be forthcoming unless the principle of a shorter working week is conceded. Post Office White Paper — page 18.

### Amdahl record

SECOND quarter figures for Amdahl Corp. were again a record, with pre-tax profit up 83% at \$22.3 million on turnover up 64% at \$73.2 million. The quarterly dividend has been doubled to 10 cents a share on the stock, which was split two-for-one in April.

### Computacar sold

THE Thomson Organisation, which publishes The Times, has bought the Computacar computerised match-making service for buyers and sellers of new and used cars from Unilever Computer Services.

## Mixed reception for Inmos



Heading the NEB venture into semiconductors and micro will be Dr Richard Pettit (left), who has been named managing director of the company. Deputy managing director is Dr Paul Schroeder (centre), and UK operations will be overseen by Ian Lloyd.

Administrative and Supervisory Section of AUEW, welcomed the venture, but Ian Benson, speaking for the union, thought

panies, was contradictory. "We are concerned that the government does not appear to have a coherent policy on either the industry or on the social impact of microelectronics."

The view from the City and from industry, where few people wished to be quoted, was decidedly less favourable.

The fact that the company will largely be run from the US was regarded as a major plus, since it would make it easier to acquire the necessary management techniques and international marketing thrust.

There was a fear that Inmos products might be subsidised, reducing, it was suggested, the technological edge that only free

● Turn to page 2

## SRG grant for UCL team?

THE Science Research Council's distributed computing project is likely to aim at standardising networks on the Digital Equipment LSI-11 processor to encourage co-operative work among the centres involved.

One of the grants is likely to go to Professor Peter Kirstein's team in the computer science department at University College, London, for work on networks, particularly those based on the X25 protocol. The grant is likely to be spread over three years and will fund a study of the design and evaluation of high level protocols, including data rates and reliability.

Full details of the SRG grant will be given in mid-August. The total available money for the project is £2 million over three years.

## 'Wasting large sums on calls to US data banks'

RETRIEVAL of scientific information from data banks in the US is wasting large sums of public money on transatlantic telephone calls, claims Dr P. S. Davidson, director of the Scientific Documentation Centre in Dunsfermline. His MP, Adam Hunter (Labour) has asked the Civil Service Department for figures on exactly how much money is involved.

Dr Davidson, who runs a manual scientific information retrieval service, has been a vociferous critic of computerised bibliographic retrieval.

val. Recently he claimed that automation in this field was aggravating the current serious unemployment of graduates. Hunter asked 13 Parliamentary questions on expenditure from public funds on telephoned enquiries to computers in the US and other countries.

Charles Morris, Civil Service Minister, replied that these costs were not distinguishable within the department's total telecommunications expenditure.

Hunter has said he is not satisfied with this answer and is pressing the Minister further.

consist of local nodes scattered throughout the US. It is expected the node processors will be Digital Equipment PDP-11/70s using AT&T's UNIX operating system.

By proposing X25 in its petition to the Federal Communications Commission, AT&T could be posing a threat to IBM's SDLC-based network protocol. ACS will also provide US users, particularly smaller organisations, with an alternative to IBM's communication services which are now deeply committed to the Satellite Business Systems venture.

Industry observers in the US suggest that user organisations may pause to reflect on the AT&T offering before expanding their communications services, causing a potential slowdown in order of communications-related equipment. If the FCC approves the ACS proposals, the network is scheduled to go live by the end of next year.

The move by the NBS to insist that all US Federal installations should implement the IBM-designed I/O standards comes after a cooling-off period, or a few months following a heated debate, with opposition to the standards being mounted primarily by mainframe manufacturers, who say that the standards might soon become

or already are, obsolete.

But far from capitulating to the argument, the standards bureau has strengthened its proposal and tightened its implementation requirements, suggesting that the only way a Federal agency could waive the standard would be to obtain permission from the Secretary of Commerce on the grounds that their use would cause "a major adverse economic or operational impact."

The NBS has proposed a package of standards including

● Turn to Page 14

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## Privacy report for Rees next week

THE long-awaited report of the Data Protection Committee is expected to be delivered to the Home Secretary, Mr. Roy Mason, by the beginning of next week. If he then decides to publish it, and indications are that he will, it will take at least three months before it is available to the public.

It now seems probable that the report will be unanimous, without the minority report that had been predicted, the committee having made a special effort to patch up its differences. Those have been deep.

There is considerable impatience in the computer industry to see the report, because projects are being held up until there is some idea of what legislation will be brought in affecting them. Conscious of this, the committee has taken steps to attempt to bypass the publication delay in Mr. Mason's Stationery Office, which is usually six months at present.

## IBM contract for AMI

FOLLOWING the \$25 million order to Intel for 4K memory chips (CW, July 13), IBM has given American Microsystems Inc a contract for design of a static RAM in AMI's proprietary V MOS technology. V MOS chips are as fast as any on the market, and 40% more compact, with consequent cost savings, an AMI spokesman in Santa Clara, California, told Computer Weekly.

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## GILB'S MYTHODOLOGY

Architectural  
view of a  
soft system

WE need better communication tools with other professionals, with our clients and users, and even with ourselves: so that we can organise our own creative thinking in a more rigorous manner.

There is such a tool in the engineering field of cost-value analysis. It was brought into the computer field by TRW systems engineers about 1974, and was called the Requirements/Properties Matrix. Using this as a practical inspiration, I have made use of the method in a number of consulting situations as a tool for documenting and analysing a system design. Everybody who has come into contact with it seems to consider it to be a powerful and useful tool for specifying and quality-inspecting a system design, so I would like to share some of the details about it here.

The tool is called the Function/Attribute Component Table. The "Attributes" are listed vertically on the left in a decision-table-like form. The attributes correspond to well-defined system goals such as cost, delivery date, ease of human use and learning, portability, reliability, etc. When necessary, for added detail and measurement precision, these goals can be "exploded" in a root-like manner, and sub-attributes may be created at will.

The "Functions" are simply an interesting set of functional viewpoints of the system. They may overlap, they may be motivated by the interests of any party. They may be hardware, software, documentation or organisational components of the proposed system. You may need to present several different viewpoints on separate F/A/C/T sheets, to satisfy various needs. A function may, just like the

attributes, be "exploded" for more detail. For example PRO-GRAMS could be detailed into specific programs. The system planning can take place top down by means of such explosions, until such a level of detail is reached that conventional low level specification techniques are appropriate (structured design, pseudo-code etc). Functions are listed horizontally across the top of the table.

The COMPONENTS are design components. These are only referred to by a symbolic code in the interactions between Functions and Attributes. A code such as DBAUDIT might be used to refer to a design decision such as:

ALL MAGNETIC FILES SHALL BE FULLY AND AUTOMATICALLY AUDITABLE AS FAR AS POSSIBLE BY AN INDEPENDENT FILE AUDITING PROGRAM.

Components may, like attributes and functions, be exploded into more detailed design decisions, at the appropriate time in the specification process: for example "DBAUDIT-PAR: The audit program shall be parameter driven for selective analysis as to input records, input fields, co-related files, depth and type of analysis and output reporting format and volume."

A design component is listed on a separate design specification sheet. High level design components are settled on before proceeding to detailed explosion. But you can explode any design component and become real design engineers and architects. To do this we require similar tools to those in use in other disciplines.

I hope we find more technology transfers like the F/A/C/T Table to help us master the complexity of our task.

## Moved with success

THE growing success of the Pricas fixed-asset accounting system (Software File, April 20) has been marked by its installation by the Data Services Division of Control Data. The package is available to network users as a batch, remote batch, or online interactive service.

The developer of Pricas, Unimation Computer Services, has moved to new offices at 1 Church Street, Stourbridge, West Midlands, DY8 1LT. Tel: Stourbridge 78361.

AN interactive financial modelling package designed and developed in Sweden is being marketed by ICL. Dataflex for ICL System 3000 equipment. The software, developed by ICL, provides similar facilities to the existing 1900 and 2803/4 versions of Prosper, though it is not compatible with these products.

A BRANCH office in Swindon has been opened by the Birmingham-based firm, Gould Compulab Systems, at 109 Victoria Road, Swindon, Wiltshire, Tel: 0793 45701.

## PROGRAMMER NOTES

Demos, Compass:  
comparing the nets

ALTHOUGH both are capable of operating on networks of microprocessors and both are suitable for applications such as real-time plant control, there are few other similarities between the CEBB's Compass scheme (CW, July 20) and the NPL's Demos project (CW, June 29).

A key distinction is that Compass is a loosely coupled multi-processor system in which each processor is programmed separately.

Demos on the other hand is a tightly coupled system in which all the constituent processors in effect make up a single computer. It is programmed as one machine.

In a Compass system, application jobs are allocated to particular processors at an early stage in the design process, according to the function to be performed. Processors would typically be dispersed geographically, each in proximity to the plant equipment it is to control.

In a Demos system, the corresponding design step is the allocation of operating system tasks to particular processors. Processors would typically be localised geographically and tasks would be assigned between them according to the natural parallelism of the pro-

blem. Thus each processor in a Compass system would in general hold a complete copy of the operating system, whereas each Demos processor is generally dedicated to a single operating system task.

These major architectural differences are accompanied by order of magnitude differences in the volume and rate of data exchange between processors.

Data exchange in Compass is essentially restricted to the passing of control parameters between related tasks. Invisibly to the user, system mechanisms automatically update the local data pool for each process at regular intervals with relevant values extracted from other processors.

The frequency and speed of such exchanges is relatively slow, being governed by the needs of power station plant.

A specific benefit of loose coupling in Compass is a degree of system resilience. Should one processor fail, it will be feasible to revert to local manual control of that function.

Another significant feature is that programs can be modified in a running system. This capability is based on an interactive editor and compiler which can be run concurrently with

application programs on each processor.

Users of Compass will vary widely in their appreciation of computer systems. In addition to an end-user oriented language, the design includes specific protection mechanisms, discriminating — for example — between privileged and non-privileged users and permitting access to facilities accordingly.

Together with facilities for data protection, these mechanisms will make possible the construction of robust systems in which jobs cannot interfere with each other's resources.

The system will also include built-in error tracking to ensure that error conditions arising from data do not affect plus outputs adversely or give misleading results.

Specifically designed to be easily portable, Compass differs in this respect from Marconi's Locus 16 distributed processing system (CW, August 8, 1974) in which the company designed its own 16-bit hardware modules, under the Alp-1 project.

The new development, also in C, otherwise bears a close resemblance to the Marconi system which, widely regarded as ahead of its time, has been marketed only for air control applications.

Concurrency requirements  
rule out Coral for Demos

THE choice of Concurrent Pascal for the NPL's Demos system further emphasises the significant difference from Compass, which is to be written entirely in Coral 66.

Concurrency requirements ruled out the use of Coral as the principal implementation language for Demos, according to a spokesman for the joint NPL-Scicon team working on the project.

Although Coral was attractive from the point of view of standards and availability, the absence of constructs for handling parallelism was a major deficiency, he said.

The language was also less strongly typed than Pascal, making it more difficult to write reliable programs, and it suffered from its relative age.

The team was, in effect, left with the choice between Concurrent Pascal and Modula as a system implementation language. Details of the enhancement of Modula for this type of application were given by Professor Wirth at York University two weeks ago (Software File, July 20).

Based on Wirth's Pascal, and incorporating work on the notion of monitors by Professor Tony Hoare at Oxford, Concurrent Pascal was developed by Brinch Hansen at Caltech in the US. He is still the only Concurrent Pascal compiler in existence.

Originally developed for the PDP-11, the compiler is used in the Demos project to generate intermediate code, which is then interpreted at execution time by the kernel resident in each processor, see Figure 1.

In addition to the interpreter the kernel contains low-level communications routines and device drivers, which could not be written in Pascal. The kernel itself is written in Coral, for which the Argus 700K, the project's current hardware, is specifically designed.

Above the kernel, which is

duplicated in each processor, software is specific to the processor on which it is running. The level immediately above, which is referred to as the application support environment, comprises high-level operating system tasks, written in Concurrent Pascal.

This includes routines for scheduling and job processing, disc file access, database management, and terminal control.

The allocation of these tasks to particular processors is performed as part of the system generation (Sysgen). Processes may, where appropriate, be multiplexed on a single processor, by making more than one process resident.

Application software	Sequential Pascal
Application support environment	Concurrent Pascal
Kernel (executive)	Coral
Computing hardware	
Interconnections	

Figure 1. Organisation of a Demos processor.

The allocation of operating system tasks to processors is essentially static.

At the highest level, application software, routines are assigned dynamically to appropriate processors by the system software. Demos currently supports programs written in sequential Pascal, but may later be extended to support application programs in Coral and Fortran.

Interconnections between the processors, electrically a single ring highway, are logically a bus. Based on executive-level block transfer, messages are passed using a three-way handshake protocol.

Inter-processor communication is programmed as a single procedure call, which is converted to an inter-processor call by the

Sysgen procedure.

One possible future development is to implement communications management as a scatter/gather mechanism built-in to the hardware. This approach would entail splitting each processor into a pair of processors: one a general purpose machine, the other a special purpose microcomputer. If adopted, this architecture would implement all kernel functions, including the interpreter, in hardware.

Demos designers note that the system is particularly intended for applications which divide naturally into co-operating sequential processes. This would include such areas as plant and process control, database pro-

## SOFTWARE FILE

## First Euro order for Trax

WHAT is believed to be the first European order for Digital Equipment's newly released Trax TP monitor (Software File, June 22) has been placed by Gemma Associates, Gemma's client, Clive Discount, a leading City discount house, changed an existing order

with Gemma to keep the benefits of the new software. Gemma said that the main advantages offered by Trax are speed and economy of applications development, automatic error recovery features and inherent application documentation.

Decision table-based  
language for PDP, IBM

A HIGH-LEVEL language system, based on decision table techniques and available on Digital Equipment PDP-11 and IBM System 3 equipment, has been launched by a specialist UK software company.

RPL, Replacement Programming Language, is a super-set of the popular Filetab and FTL6 packages now marketed by the National Computing Centre.

Written by the chief designer of these products, Tom Barnard, it will be sold and supported by Filetab Support Services, a company which previously concentrated on Filetab and FTL6 consultancy services.

Already running at some twelve test sites, the PDP-11 version, designated RPL(11M), runs under all major operating systems, including RT11, RSX, RSTS/E, COS350, and CDS500. It will also run on micro systems based on the LSI/11, and on PDP-20 systems.

Due to be formally released in about six months, the IBM version will be supported on System 32 and System 34 machines in addition to the System 3.

A fully compiled language, RPL(11M) offers major advantages both in speed of execution and speed of program development over its chief DEC rivals, Basic-Plus and Basic-Plus 2.

Fully compatible with PDP-11 file formats, the most basic use of RPL is as a report generator from existing files. Inbuilt multi-level control breaks, automatic totalling and multiline tabulation are among the facilities provided.

The language is also appli-

cable to the development of complex application systems. In addition to instructions for character string handling, indirect addressing and table look-up, it supports a variety of disc file access methods, including chained record, hierarchical and indexed sequential organisation.

At Airfix Industries, an early site, RPL's variable length chained file capability enabled the development of a complete bill of materials processor.

Not restricted to batch operation, the system offers facilities for screen handling and data input validation for online applications. It accesses standard DEC operating system mechanisms for locking out concurrent file update attempts.

An interesting feature of the package is that it includes its own virtual storage run time system. Running under the main operating system, and including the RPL language compiler, this software is responsible for paging user programs in and out of memory and effectively eliminates restrictions on program size.

The monitor occupies an 8K memory partition on the PDP-11 and requires 96 disc blocks.

RPL is input at a terminal using free format statements. A direct input option allows for online syntax checking of a program; alternatively program statements may be entered to an off-line file for compilation later.

Programs typically begin with a series of dictionary statements, mapping data names on to file record layouts. A central source code library and copy statement are provided to facilitate the incorporation of

## Interface for Shadow, Librarian from GAP

AN interface between ADP's Librarian Online and Allegro's Shadow TP monitor has been developed by Computer Program Products, the software products arm of CAP-CP. CAP has also announced the latest release of Librarian, which features a comprehensive archiving capability.

The new interface means that users of the source program retrieval and maintenance

system can work online under Shadow. Librarian already offered interfaces to Cics, Task Master, and Datacomm.

A particular benefit of the new Librarian archiving facility, called Archie, is what CPP describes as "total retention." This means that all changes made to a source program at any time during its life can be permanently retained with the program.

The system provides for the retention of up to 255 versions of a program, any of which is instantly retrievable. Also retained is information regarding the type, date, time, and level number of each update.

All of this information is kept within the source program itself, which is subject to the Librarian's compression algorithm. The eventual size of a program is determined by the number of times it is updated and the number of statements added during its life.

Archie operates on both disc and tape master files and allows programs to be switched from archive control to normal processing if required.

CPP notes that the new feature allows the elimination of all manual source program maintenance activity. It also provides a full program modification audit trail, including the physical data records corresponding to each change.

DEC signs up  
Nastran

THE structural analysis package, Nastran, originally developed under the direction of Nasa, is to be marketed as part of its software product range by Digital Equipment Corp. DEC has also signed a marketing contract for Gap VI.

Both packages are now available on DECsystem-10 computers and are likely to be converted to run on the new Vax 11/780.

Gap VI, the latest version of a structural analysis package known for its simplified user interface, was developed and is supported by the University of Southern California. Nastran is supported and marketed by MacNeal-Schwendler.

The announcement follows Atkin's implementation of Aes for the DECsystem 2020. Aes also runs on the DECsystem-10 and may be adapted for Vax 11/780.

DEC's Engineering Systems Group has also announced new word processing capabilities for the IAS, Vax/VMS, and Tops-10/20 operating systems. The new facilities are functionally equivalent to the Document Exchange utilities already available for RSX11M and RSTS/E.

## Manchester office

A BRANCH office in Manchester is to be opened by Systems Designers Ltd, the Surrey-based computer systems consultancy. The new base — at 40-42 Washway Road, Sale, Cheshire — will complement existing SDL activities in the North-east, notably a recent £827,000 contract with British Steel at Redcar.

## Turnkey system

A COMPLETE turnkey accounting system, worth £130,000, is to be developed by Haven (Computer Services) Ltd for the National Supply Corp of Libya (Nasco). The hardware is a 64K CMC Really system in the Royale version, incorporating the new firmware and Release 3.0 of the operating system.

Improving  
throughput  
of DOS/VS

A SYSTEM software package which can substantially improve the throughput of IBM DOS/VS has been launched in the UK by Westinghouse Management Systems. The product, Fast Transient Loader (FTL), enables users to make specified B-translates permanently resident in main memory.

Developed in the US by Goul Systems, FTL achieves its effect by reducing contention on the system residence volume (SYSRES) and by freeing transient areas more quickly.

When any transient is to be fetched into either the logical transient area or CRT transient area, FTL will determine whether the phase is resident in storage. If it is, it can be moved directly to the transient area, eliminating the need to read the core image library.

Any number of B-translates, including DDG or CRT translates, can be supported by the system and can be placed either in real or virtual memory. The system requires a minimum of one 2K page of real storage in which to hold execution code and a directory of resident phases.

To facilitate tuning, the software provides statistics of transient loading activity, on a daily basis, and the phase listing the most frequently referenced non-resident phases.

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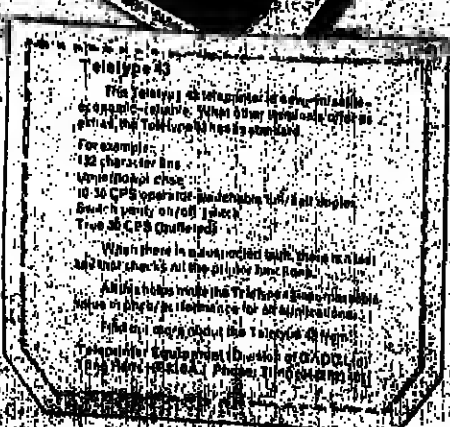
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# PEOPLE

## Angus Ogilvy joins GEC

AMONG the appointments made to the UK General Electric Company board recently is that of Angus Ogilvy, who becomes a non-executive director. Robert Clayton and David Powell become executive directors.

Clayton, GEC's top micro man, has been with the company since 1937. He has been technical director since 1964, and is also a director of IEE Management. His career has included the managing directorship of GEC Electronics, 1963-6, and of GEC Research, 1966-68.

He was chairman of the Electrical Engineers' Association 1966-7, and of the IEE Electronics Division, 1968-9, and president of the IEE from 1975-6. He has served on various government and industry committees for research in electronics.

Powell has been assistant general manager of GEC Power Engineering and assistant managing director of GEC Telecommunications. He became director of industrial planning in 1969 and managing director of GEC Diesels in 1971.

Michael Pye has become managing director of Sinclair Radionics. He was technical director of the company from 1973-76, then moved to Gillette in Cambridge, Massachusetts to become director of electronic development, responsible for electronic appliances, clocks and watches and smoke detectors.

John Duffy, corporate vice-president of Fairchild in the US, has become general manager of the discrete products group, and is succeeded as head of worldwide semiconductor marketing by division vice-president Andrew Prosser.

Frank Farret, formerly technical manager with the Communications Centre Ltd, has become field sales engineer with Microbit.

Michel Guy becomes marketing manager for Hughes Microelectronics. He will be responsible throughout Europe for the products of the Hughes divisions of Weybridge and Glenrothes, and will head the Brussels and Paris offices. His most recent job was as European military and aerospace marketing manager with National Semiconductor, but most recently he has been attending INSEAD, the European business school at Fontainebleau, where he qualified as Master in Business Administration.

Robin Jamieson-Jones, previously a senior systems analyst with Hongkong Consolidated Copper Mines in Zambia, has become a systems engineer with Clincom Systems International in the UK.

Ian Fleming has become manager of the Northern software centre of Philips Data Systems, in Manchester. He was formerly a systems officer with the Co-operative Bank.

### IDPM committee

At the AGM of the Institute of Data Processing Management, West of London to Oxford branch, the chairman, J. C. Nunn, was elected for another year.

A further two committee members — Derek Hurrell and Colin Bendall — were elected; otherwise the membership of the committee remains the same as last year.

Peter McPoland has joined Jenson Computer Systems as senior programmer. Previously he was a programmer with Unigate and Rolls Royce. David Haines joins Jenson as a trainee programmer.

Stuart Pope, formerly a marketing executive with Computer Systems and Programming, has joined Strand Computer Systems in a similar capacity.

Bert Fansome of NCR has been appointed district manager of the commerce and industry division. Previously he was vocational services manager with responsibility for systems and programs services and for the marketing aspects of commercial application software.

George Tannous, previously marketing manager for the Middle East and Africa with Memorex in Brussels, has joined Ite International as director with overall responsibility for the management of the company's activities in the Middle East, Africa and India.

John Clifford, Joe Hazelwood and Malcolm Webb, of computer stationary printers incubator, have been appointed to the board. Clifford, who was formerly works manager, becomes works director; sales and commercial manager Hazelwood becomes sales director; and Webb, previously financial manager, becomes financial director.



THE Computer Tournament for schools held recently by the Industrial Computing Bureau GMS Computing as part of Sheffield Science and Technology Fair was won by the team from the Henry Fanahawe School, Dronfield.

The teams in the final had to find the best routing schedule for transporting containers from Sheffield to York. The problems were programmed in Basic by GMS, and the contestants used the IBM Call System to help them.

In our picture above Martie Chawlin, GMS managing director, presents the GMS Trophy to the winners, (left to right) Mark Ashton, Peter Ashforth, Ian Allison, Craig Turner.

Bob Monte, until recently vice-president of field operations with Ite International, has been promoted to executive vice-president of the field engineering division.

## DIARY

AUGUST 9-10 Computers, communications and technology transfer, Jerusalem conference on Information Technology, Information Processing Association of Israel/IEEE, Jerusalem.

AUGUST 11-12 Royal Inst. Association of Independent Computer Specialists, From Tower Pier, London, 18.00. Tickets £5.00 from AICS, 01-437 0678.

AUGUST 21-24 Operational data security workshop, Operational Data Security Corp, City University, London EC1. Register August 18: 01-253 4306, ext 347.

AUGUST 21-26 Cybernetics and systems fourth international congress, World Organisation of General Systems and Cybernetics, Amsterdam, Otella Dr. J. Rose, College of Technology, Blackburn, tel: 0254 64221.

AUGUST 22-23 Conference on parallel processing, IEEE Computer Society/Wayne State University, Detroit, Michigan, USA.

AUGUST 23 Meeting, VM UK and Ireland User Group, Maidenhead, Details from Ian Stinson on 01-588 0111, ext 720.

AUGUST 23-25 Siggraph 78, 9th conference on computer graphics and interactive techniques, Association for Computer Machinery, Atlanta, Georgia, USA.

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## 'Quicker to get a loan from our local bank than from ICFC or DoI'

IN a hard-hitting attack on two major sources of finance, the Department of Industry and the Industrial and Commercial Finance Corp, John Neale, managing director of the rapidly expanding terminal and microcomputer manufacturer, Transdata, has described the response of these organisations to requests for working capital as diametrically opposed.

Speaking at a lunch to celebrate Transdata having passed the £1 million turnover milestone, in its financial year ended June 30, Neale said that it was easier and quicker for Transdata to get a loan from its local bank than from the ICFC or the Department of Industry.



Transdata, which is now well established and highly profitable, can increase its overdraft at its local bank by 50% with no more than a week's notice, according to Neale. In contrast, if Transdata tried to get a loan from the ICFC it would typically take three months to get the money, and if it went to the DoI it would probably be a long time before it was repaid — like ICFC waiting a share in the company.

Neale said that the DoI was really interested only in lending money for product development and not in providing working capital for expanding production and marketing. The DoI usually

## Name change for Info show

THE exhibition and conference that made its debut in April as Info 78 (CW, April 13), is to be repeated next year from April 3/8 at the same venue, the West Centre Hotel in London. It will be called Info 79 — the Business Computing, Word Processing and Information Handling Exhibition and Conference.

This year's show was called the Information Handling and Management Exhibition and

Conference, and the organiser, BED Exhibitions of Wallington, Surrey, says that many prospective visitors might have identified it with multi-million pound management information systems and decided that it was above their heads. BED believes that more people would have visited the show had they realised that the emphasis was very much on the practical systems applicable to smaller businesses.

## New company's commercial system for £10,400

A COMMERCIAL hardware/software package called System 800 which will cost as little as £10,400, including a 16-bit processor and disc basic operating software, is to be launched by a new company, System 800 Ltd of Newcastle-upon-Tyne.

The processor and memory for System 800 are built by Electronic Memories and Magnetics in the US and have been supplied by EM&M to customers there since last October.

System 800 Ltd in the UK has developed a disc basic operating system for the EM&M processor which can handle multi-tasking by up to four terminals, but not multi-programming. The Newcastle firm is now

producing a range of applications packages to handle jobs like payroll, purchase, sales, stock, insurance and HP/credit.

System 800 Ltd says that it plans to sell the EM&M processor to systems houses and specialists in the UK on an OEM basis as well as selling System 800 to commercial end users. Under its agreement with EM&M, System 800 Ltd has the rights to manufacture the processor in the UK if EM&M stops building it.

For £10,400 the System 800 purchaser will get 64K words of memory, one VDU, a 60 cps printer and a five Megabyte cartridge disc drive, as well as the processor and operating software. The applications pack-

ages will cost £500 each on top of this. The biggest System 800 configuration will still have a 64K word memory, but will have 40 Megabytes on disc, a 300 lpm printer and eight VDUs.

System 800 Ltd is a subsidiary of Cattle Holdings, a 1100-based group with a turnover of nearly £40 million a year and interests in consumer finance and insurance. Cattle's owns one other computer firm, Hadrian Computer Services which, like System 800, is located at Newcastle. Hadrian runs a bureau service on an ICL 1903T and writes applications software for machines like the ICL 2903 and the IBM System 3 and 32.

## Brokers strongly back buying of ICL shares

By Tim Palmer

BACKED with evidence that ICL is better placed to compete with IBM than most of the US mainframe manufacturers, London stockbrokers' Laurie Millbank have come out with a strong recommendation to buy ICL shares.

"We believe that ICL has the right combination of products, technology, financial strength and management to continue growing at an above average rate, and consider that despite the competition from US companies, ICL has a bright future in data processing," say the brokers at the conclusion of the 32-page in-depth examination of the company.

"The market has taken a very cautious view of ICL for several years, which we feel does not adequately reflect either ICL's recent successes or future prospects. ICL has grown faster and has been far more successful in innovating than its major US

competitors, but it is on a lower rating than any of these companies while having a higher yield.

"Furthermore, compared to a vast majority of UK industrial companies, ICL's record is very impressive, yet the shares also stand at a discount of 35% to the market. We consider that this anomaly will be rectified soon and that at around these levels, ICL represents outstanding value."

On ICL's ability to compete against IBM, the report notes that ICL's foreign turnover has risen from £80 million in 1973 to £212 million last year, giving it second place to IBM in the non-US world market. It also gives a table purporting to show that last year, ICL's sales worldwide grew faster, at 45.2% than any of the major US manufacturers apart from Digital Equipment, which had 43.8% growth. However, it does not point out

that ICL's growth was dramatically increased by the inclusion for the first time of Singer sales in its total. Even so, the comparison is noteworthy in that Honeywell, number three in the growth stakes, improved only 16%.

The report is enthusiastic about ICL's technical performance, saying that the 2900 series hardware exhibits "exceptional versatility and power" and that the software utilises "very advanced design concepts."

It also believes that while the 2000 design concepts are valid throughout the 1980s, the US manufacturers will have to undertake very substantial product developments over the next few years—and to substantiate its claim that ICL is strong in basic research, points to the Distributed Array Processor, which it believes will be a significant product in the future.

A further major source of financial strength identified by the report is that "ICL's return on capital employed is higher than that of any of the major computer manufacturers except IBM."

The report is bullish on ICL's advanced architecture in the 2900 series.

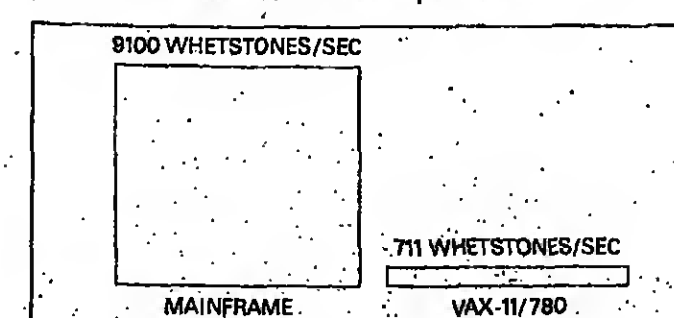
"The majority of 2000s are still in their first version," it says. "Against this, IBM and the US majors have computer architecture dating from the 60s, which has already been enhanced so much that there is little potential for further improvements. Hence, while ICL can probably double the performance of the 2000 range by enhancements, to get significant improvements, the competitors will need to introduce new products." This analysis ignores the NCR 800 series, particularly the Critterions, which are rather newer than the 2000.

# Digital's VAX-11/780 takes on the world's leading scientific mainframe.

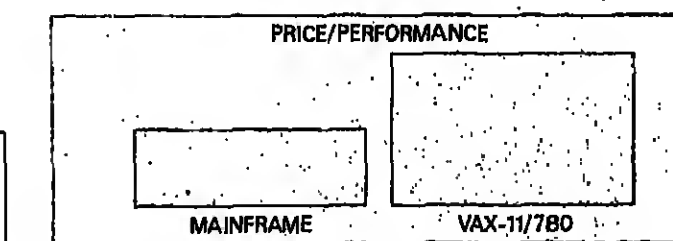


## And wins two rounds out of three.

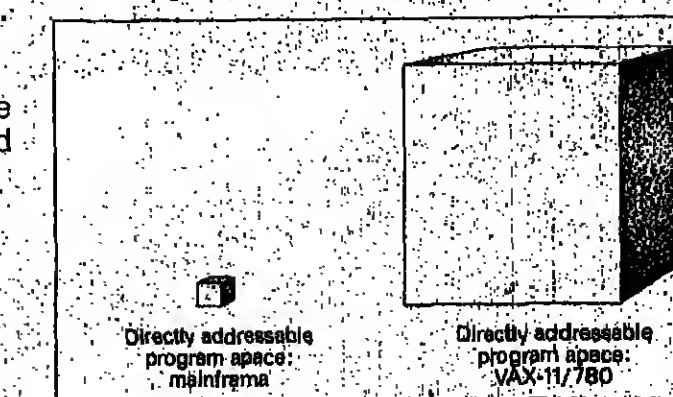
**Round one to the 60 bit mainframe:** Speed. The mainframe is still the speed champion with 9100 Whetstones per second.



**Round two to VAX: Price/Performance.** The 32 bit VAX is the world's fastest mini. A VAX system runs 711 double precision Whetstones. That's one twelfth the speed — at one twenty-fifth the cost. A dozen VAX systems could equal the throughput of the mainframe system — and you'd still save literally millions of dollars.



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## Danger of no real employment policy

MAY I express unbounded support for I. White's letter (CW, July 6). As a first step we must accept the seemingly inevitable reduction in employment levels to a fraction of today's.

However, I do believe that there is not enough emphasis on how "ordinary people" will "ensure that the (i.e. micros) benefits will be shared". Governments of all persuasions do not really see this as an imminent problem. In spite of public statements, it is something which will occur outside the life of any one government and so is readily kept at a low priority.

The most likely result is that no real policy will be adopted and we will find that by 1990 we have 15-20 million unemployed and/or a revolution on our hands.

Even assuming that the next government can be persuaded to take action there are two critical issues which I believe would be excluded: 1. What basis for the distribution of wealth could and should be adopted by the introduction of a national dividend? 2. It will be necessary to accept

that the concept of a permanent growth economy will have to be abandoned well before the end of the century.

If these two issues were tackled it may be found that solutions would be mutually exclusive.

I believe that the whole issue of a workless (or less work) society requires mammoth, planned social and educational change. Unfortunately, neither political party is remotely equipped to tackle it and, at the moment, one feels that we can only sit and wait for the revolution, whether of the right or the left.

To contemplate such a frightening possibility leads me to a single conclusion. There is a moral duty on all computer personnel to wage a campaign to get the government (whoever it may be) to adopt policies to combat the above scenarios, and to do it along the lines suggested by I. White. We may find that we are not as brave as Anatoly Scharansky and I hope we never have to be.

MIKE LYNN

Holders Hill Road, London, NW7.

## LETTERS

To: The Editor, Computer Weekly,  
Dorset House, Stamford Street, London SE1 9LU

## Why Scharansky should be set free

I CONGRATULATE Professor Donald Michie on his telegram to Moscow (CW, July 13). I also sent a personal telegram to President Brezhnev. Of all statements expressed so far, the nearest to my point of view is that of Andrew Young, whom I quote:

"I think the present Soviet dissidents may well prove the salvation of the Soviet Union, that they are a natural development of Soviet society, but its

leaders have not yet understood it."

The indictment against Scharansky is on the ground of betrayal of his nation. As I have a Czech mother, I fully understand how grave such a charge is to a Slav people.

That nation, the people, are the fundamental unit and real hero of all Slav folklore. The idea is intimately connected with the soil, Mother Earth, the rivers, fountains, woods and hills of the

## Peculiarities of job ads 'quite amusing'

THE peculiarities of the English language can be quite amusing at times; the peculiarities of the job titles given in some of the ads carried in the computer press can be both puzzling and amusing.

Computer Weekly on June 22 carried an ad for Renl Software

Engineers. This would seem to be on ambiguous title, and several possibilities spring to mind.

In the Fortran sense, Renl is considered a type, as opposed to Integer or Complex. But Renl can also in the Fortran sense be either single precision or double precision.

The title would have been much clearer if it had been specified as Double-Precision Renl Software Engineers, or Single-Precision as the case may be.

If the ad was intended in the Fortran sense, it can also be assumed that the company concerned did not want a whole number of applicants (part-time perhaps), and that they must not be complex in nature.

The word Renl can also be seen as opposed to Imaginary, in which case it is possible that the requirement was for software engineers who actually existed and are not some figment of the imagination. Or perhaps those who know they are software engineers and not only think that they are.

If one reads further in the ad, the puzzle becomes even greater, since the specification here is for Real Time Software Engineers. Perhaps someone could explain to me the significance of this, since all the software engineers that I know consume real time in order to produce their engineering products.

ARNE ROHDE  
Complex Program Engineer  
Struer, Denmark.

## 'Offensive' photo protest

I FOUND your story headed Model welcome for first 2000 (CW, July 6) and the accompanying photograph, offensive.

Am I to assume that Computer Weekly condones and endorses in the computer industry by publishing this photograph on its front page?

G. M. de la MAHOTIERE (Ms)  
Department of Psychology,  
Birkbeck College,  
London.

I felt that the photograph was an unusual variation on the "order delivery" picture, summarising both the system used and the application. The use of an attractive female in a photograph does not in itself constitute "sexism" and items in our editorial columns are not meant to be a guide to advertisers or vice versa.

The Advertising Standards Authority provides guidelines on what is and is not acceptable in advertisements. EDITOR.

## Guilt-free leisure

I. WHITE (Letters, July 13) is right. We should look forward joyfully to the lessening demand for labour. A greater problem than adjusting the economy to meet this change is that of altering attitudes to the work ethic.

It is not easy to persuade millions of people who derive great self-respect from the importance of their work that they are really only indulging their own egotistical needs.

To expect labour unions to aid in preparing their members for the change is perhaps being naïve, not just because some of their more active officials get their kicks from "organising" and the power that stems from

it. The less important work becomes in the life of individuals, the less power will derive from it.

A better vehicle for preparing for the new life-style is the education business and, contrary to the unions, it stands to gain in significance.

The vast amount of guilt-free leisure in the future will enable people to fulfil themselves more completely, and "ons men" in adult education in the widest sense.

But, as Mr. White suggests, if peoples' liberation comes without preparation it may come violently. KEN DAVILL

## IBM share of world base on the increase

IBM'S share of America's worldwide computer base is on the increase, according to Clarence P. Lecht, president of Advanced Computer Techniques. His analysis is based on soon-to-be-published figures from International Data Corp and the work of his company's Technical Analysis Group.

According to Lecht, the value of US-made computers installed worldwide increased from \$56,000 million in 1976 to \$76,000 million in 1977. This increase of \$20,000 million, or more than 37 per cent, includes sales and if sold value of systems that were rented or leased. The total encompasses general-purpose computer systems, including large minis and all mainframes.

Of that total, IBM's share of the 1977 base was more than \$54,000 million, or 71.1 per cent, up from 68 per cent in 1976. Honeywell slipped from 9.5 per cent of the US supplied base to 7.5 per cent, a change that Lecht attributes to the sale of some interest in Bull to the French. Univac held 7.5 per cent of all American computers in 1977, approximately the same share, 7.8 per cent, in 1976.

Burroughs built 5.8 per cent of all US machines installed worldwide, and maintained its share throughout the two years studied. CDC, however, slipped from a 3.8 per cent share of the base in 1976 to a 3.4 per cent share in 1977. Lecht believes that the company made up for any

slippage of its installed base by increasing its services and other revenues.

Trailing the pack, according to ACT's analysis, was NCR, which had 2.3 per cent of the 1977 base, down from 2.8 per cent of the 1976 figure. Lecht believes NCR will have a brighter future than the figures suggest. DEC which sells mostly small systems of relatively low value, maintained its 0.7 per cent share of the computer base.

While the industry's base grew in value by 37 per cent, inflation, according to Lecht, may account for half of the growth.

Lecht cautions that the changing definition of computers and the changing mix of goods and services in the business make the 1977 numbers "less correct than they ever were."

## Active and passive

A NEW serial data analyser from Hewlett-Packard called the 1640A can be used both actively and passively. When passive, it can be connected to an RS232C (V24) interface and monitor and record both the transmit and receive data. When active, it can simulate a computer, modem or terminal, and can interact with the network to which it is connected.

## GOVERNMENT COMPUTING

### HM Customs and Excise, London

A two-terminal minicomputer system comprising 64k 16 bit main memory, magnetic tape unit (9 track NRZ 800 rpi) and matrix printer is required for statistical analysis and operational research work. The equipment is to be installed as soon as possible after mid-March, 1979.

Applications for operational requirements quoting CEH/7 should be sent to Central Computer Agency, Room 822, Riverwalk House, 157-161 Millbank, London SW1P 4RT.

### Ministry of Defence

Defence Statistics Branch, Whitehall, London

A small computer able to store and readily access limited quantities of data and perform advanced statistical calculations is required for installation beginning of March, 1979.

Applications for operational requirements quoting CEH/6 should be sent to Room 822, Central Computer Agency, Riverwalk House, 157-161 Millbank, London SW1P 4RT.

## Potential Data Control Staff

should attend the Infotech Operations training course Data Control Techniques.

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Infotech Operations Ltd.

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## OP SPOT

### HINT OF THE WEEK

## How to find an available disc drive, speedily

THIS week's hint relates to the mounting of discs in the IBM OS/VS environment.

Under normal circumstances, each time the operator wishes to mount a disc volume he has first to use the DISPLAY command in order to find out which drives are available.

This is particularly time-consuming when the system has many banks of the units for he might have to repeat the command several times before

he finds a drive which is not being used.

To avoid this, use the MOUNT command, but specify device type instead of the actual address. For example:

M3330,vol=(SL,XXXXXX)

The system will then scan his list of 3330 disc drives and send the operator a message giving him the address of the drive on which the volume is to be mounted.

## Noise levels—how bad is intolerable?

OPERATIONS staff are often expected to carry out their function in areas where the level of noise borders on the intolerable—that is the opinion of an operator who contacted Op Spot.

He backed up his argument with a description of his installation and the conditions of work the operators have to contend with there.

"The air-conditioning system is not all it should be, and in an area measuring about 40ft x 25ft we have three printers, two teletype consoles, a card punch, a tape reader, a tape punch and a graph plotter. This makes for an extremely noisy environment."

According to the operator, a shift leader, a female operator and himself have all suffered from headaches while at work, and he attributes this to the environment.

The management is fully aware of the operators' feelings about the matter. On one occasion a noise-measurement test was carried out and the operators were assured that the level of noise was not a health hazard. However, soon afterwards maintenance engineers carried out some work on the air conditioning system and he says that it "resulted in a considerable improvement."

But the noise from the peripherals is still a great problem and the operators are to lobby for another test to be carried out. Next time they will insist on seeing its results.

He attributes the management's reluctance to take action to the fact that the computer is due to be relocated to a new area in a couple of years' time.

He continued: "I appreciate that the management is re-

stricted by a tight budget and that two years appears to be a very short time. But when you have to work in the area every day it is a considerable period."

He looks forward to October 1 when new rules will come into force under the Health and Safety at Work Act (Op Spot, June 8).

From that date onwards, provided the staff are members of a trade union, the company must form a safety committee by which staff and management can discuss matters relating to the work environment, with a view to reaching practical conclusions.

I have consulted an expert on the matter, and my advice to the operator is this:

Contact your local Health and Safety Executive and get them to visit your installation. If they think the conditions of work are intolerable, they will take the appropriate action.

## A good servant, a bad master

LIKE fire and water, an operating system can be a good servant but a bad master.

Indeed, it will either dictate the manner in which the console operator runs his system or, alternatively, be used by him in order to optimise throughput and make his task as easy as possible.

Someone who knows how to use his operating system's facilities will make operating seem simple, while another who is less technically aware will often give the impression that the job is extremely difficult and harsh.

Let us consider a situation, in the IBM OS/VS environment, in which the operator might use that system's commands to manipulate the job input and output queues to his advantage.

Supposing that out of a shift comprising three operators, one is absent through sickness and another is at lunch. The operator at the master console is therefore the only person in the computer room, and as such is responsible for all peripherals in addition to the console work.

Of course the operating system has no way of knowing about our unfortunate friend's predicament, and so it continues to initiate jobs, call for tapes and discs to be mounted and request that the printers be supplied with the appropriate stationery.

Before long he will find himself running between the console and the peripherals and on returning finding more system requests, and so it goes on. What should he do in this situation?

Let's disregard the fact that he should complain to his operating system manager about the staff shortage anyway, and look at a couple of IBM OS/VS commands which he could use to great effect: the HOLD and RELEASE commands.

So what's new anyway? Many of you IBM operators may ask. Well, I must emphasise that the hallmark of a good operator is not what he knows in theory, but how and when he puts that knowledge into practice.

Firstly, then, he must use the HOLD command to stop the system from taking any more jobs from the input queue, and to prevent it from transferring data from the output queue to the printers.

Secondly, he should satisfy all the system requests for tape and disc mounts, in order to keep everything "licking over". For the time being he should ignore any requests for stationery changes.

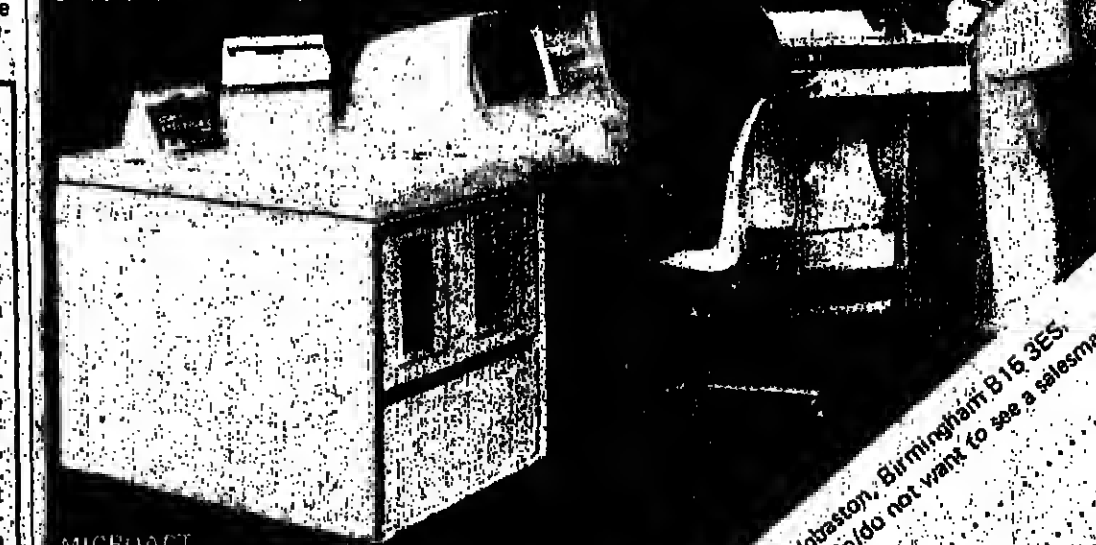
Next, he must release all input queues which, according to installation standards, will not request any tapes or discs to be mounted. He should then consider the jobs which will require volumes to be mounted, and reorganise the queues ensuring that jobs using the same media will run in sequence or concurrently. After ensuring that all necessary discs are mounted and that the tapes are at hand, he should release the remaining queues.

As far as the printers are concerned, he should check that one or two have plain paper on them, and release the appropriate output queues. Output requiring preprinted stationery should be held until help is available.

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## Series to help managers

A SERIES of talks on audio cassettes to help managers keep up-to-date with developments in computing has been introduced by the National Computing Centre. Called Talking Points, the tapes are accompanied by illustrations, diagrams, and self-checking questions, and each session takes about 15 minutes.

Topics of the first tape will be: introducing microcomputers, computer output to microfilm, database organisation, and computer security. Six topics cost £116.44.

## Penril modem

FIRST of a series of modems to be announced in the UK this year by Radliff Telecommunications Division is the 2400 LSI, made by Penril Corp in the US. The 2400 LSI conforms to CCITT V28 and V26 bis, and has Post Office approval. The modem includes a test pattern generator and analogue and digital lock-back checks. It sells for £162.

## CAD symposium

A SYMPOSIUM on Computer Aided Design for digital circuits and systems, sponsored by the EEC Commission, will be held in Brussels from November 27-29, 1978. Results of a study carried out on behalf of the Community by Sagel will be presented and speakers from the US, Japan and Europe will give papers. Cost will be \$170.

## DG profits up 37%

IN the 12 weeks to June 3, 1978, Data General made a pre-tax profit of \$17.9 million, up 37% on the same period last year.

## Tailored to fit

UNDER a contract worth well over £300,000, Anker Data Systems is supplying Burtona, the tailoring group, with 441 electronic cash registers for Burtona shops all over the UK. The registers are ADS Omron 573 units.

## Banking on a profit

NEW YORK Times Information Bank, the online retrieval service for news and current affairs (CW March 2) lost \$900,000 in operations last year. This is an improvement over the 1976 loss of \$1,600,000. The paper says it is confident that the bank will "ultimately" turn in a profit.

## \$100,000 contracts

AIR-conditioning systems supplier, Wright Air Conditioning (Scotland), has secured two contracts worth £100,000. The first is with Aberdeen District Council and the other with A. R. Findlay, domestic hardware wholesalers of Glasgow.

## Prestel service for young job-hunters



Prestel comes to the aid of student job-hunters.

THE first commercial application of Prestel has been launched: an online job advertising service for graduate recruitment. New Opportunity Press, which runs the service and calls it Careerdata, has already installed 14 viewdata terminals in university and polytechnic careers offices, for students to use in looking for job openings.

The service will be completely free to the job-hunters, being paid for by the firms whose jobs are advertised. Only the charge for the telephone call will have to be paid for by the university; the terminal is provided free, together with a user number that allows access only to Careerdata, excluding other Prestel services.

The viewdata terminal is a modified television set connected to a modem. The user calls up the Post Office's online computer at Martlesham Heath, where of the many thousands of pages of text available, 3,000 have been allocated to Careerdata.

Pages are selected with a numeric keypad, using a "tree" indexing system; each page shows a list of the pages that can be selected next, as one goes down the tree to get more detail. Each page can hold 22 lines of copy, 39 characters wide.

Jobs on Careerdata can be accessed by three indexes: employer name, type of work, and application. Each of these has an alphabetical index that the user works his way through. An employer is allocated as many pages as it chooses to pay for, and can arrange these pages in any way it likes, with jobs grouped geographically, for instance, or by type of work.

There is a standing charge of £150 a year, plus £20 for each frame entered, and 1p every time a frame is accessed. This last charge is the Post Office's, and means that if 1,000 students look at five frames each over the course of a year, the subsequent charge will be £25.

The system has the distinct advantage of immediacy. In that vacancies can be online within hours of arising, and also can be removed the moment a job is

## Collecting weather data

TWO Digital Equipment PDP 11/05s are being used by EMI Electronics to collect, store and process oceanographic and meteorological data relayed to them by the UK National Data Buoy, DB1, which is now stationed in the South Western Approaches, about 150 miles from Land's End.

Developed by the Saab Group of Companies, the buoy is continuously collecting the data for the benefit of the offshore oil and gas industry, and transmits the information to the land via a high-integrity telemetry link. Data will also be made available to the UK Meteorological Office to assist in the completion of synoptic weather forecasts for the UK.

## US boost for X25

## From front page

ones for an I/O channel-level interface, an accompanying power-control interface and, for the first time, a proposed channel-level operational specification for magnetic tape.

This package, which the NBS hopes will be difficult to tear apart, is aimed at saving as much as \$55 million over the next five years in "trimming the cost of buying new computer peripheral equipment."

The NBS move confirms the prediction of a leading US senator, Fritz Hollings, who has said that the NBS is the focal point of the Government's five-year plan to "achieve much closer links between government procurement and the meeting of acceptable standards."

## Hawker Siddeley £135,000 order

THREE 60K Burroughs B814 computer systems worth £135,000 have been ordered by Hawker Siddeley Power Engineering, one for each of its main UK offices.

## Level 64 picked for ease of upgrading

INSURANCE company Herits of Oak Barnet of Leicester has replaced its six-year-old Honeywell 1015 with a medium-scale Level 64/30 mainframe, citing ease of conversion and field upgradability in its future as reasons for its choice.

## Name change

SUNNYVALE-BASED Ampco Inc. has sold its rights to the name of San Antonio, Texas, to be used as a computer peripheral products division.

## MICRO NEWS

## Ferranti may enter high-end market

FIRST samples of the new Ferranti multiply and divide circuit for its F100-L 16-bit microprocessor are expected to be available by the end of this year, and the development could mark the start of a significant expansion programme for the company in the high end of the market.

Far the device, in essence a 16-bit slice processor, will be a fast device, with a total elapsed time between sensing an instruction and completing the task in the range of 7-13 microseconds. Its capabilities will include adding two 16-bit numbers to produce a 32-bit number, and dividing a 32-bit number to produce a 16-bit result.

In its current form the device is not cascadable, ie it will not be possible to contact two or more together to produce longer word-length processors in the manner of bit slice devices like the AMD 2800 series.

Ferranti, however, is considering such a development for the future. It probably would be

broadly compatible with 2900 type processors, and by using the company's uncommitted logic array technology, it feels it will be able to develop rapidly the necessary support circuitry.

An obvious early market for such a move undoubtedly would be the company's own Argus range of minicomputers, which already utilise the AMD part.

There is also the possibility that the basis of the multiply/divide circuit will be incorporated in a revised version of the F100-L itself. The current processor uses a 16-bit serial function unit. The decision to use this approach was taken by the company as a trade-off between its smaller size, but slower operating speed, which is largely compensated by the fact that the unit uses fast bipolar technology.

Such a development would produce a 16-bit parallel version of the processor that could offer a doubling of processing throughput without any technological development.

## Grand Met sets up applications workshop

THE diversity of potential applications for microsystems within the Grand Metropolitan group of companies has prompted it to set up a micro "workshop" to develop them.

Headed by Ian Fitzpatrick, the workshop comprises the five main Planning and Research Group, part of the Technical Division of Grand Metropolitan Information Processing. It is based at GRIP's Lixbridge bureau, where it has access to an ICL AS/5 and an ICL 1903 for its systems development work. The ICL machine is to be replaced in October with an IBM 3031.

Though, in the future, it may consider outside contracts, the group's current activities are solely concerned with applications within Grand Met. These involve around producing software implementations that run on readily available microcomputer hardware, the current

favourite system being the South West Tech 6800. There are no plans for the group to enter the field of hardware design as well.

The work currently being carried out by the group includes the development of a system to control the ordering and stock of milk delivery roundsmen for a dairy products company within the group. Based on an SWTPC system with two mini floppy drives, it would be installed in the regional depots of the company.

At an early stage of evaluation is an order entry system that would be involved in a company exporting alcoholic drinks, while another development the group is working on is for using micros for data collection purposes for a stock-recording linear program that is already in operation.

## Low power standby ROM

A NEW 64K bit read only memory has been introduced by Mostek that offers a low power standby mode of operation which is said to increase both device and system reliability.

Known as the MK 38000, the memory requires only a single five volt power supply. It is organised as 8K by 8 bits and offers a maximum access time of 250 nanoseconds.

Edited by Martin Banks

## Computer retailing shop for Liverpool

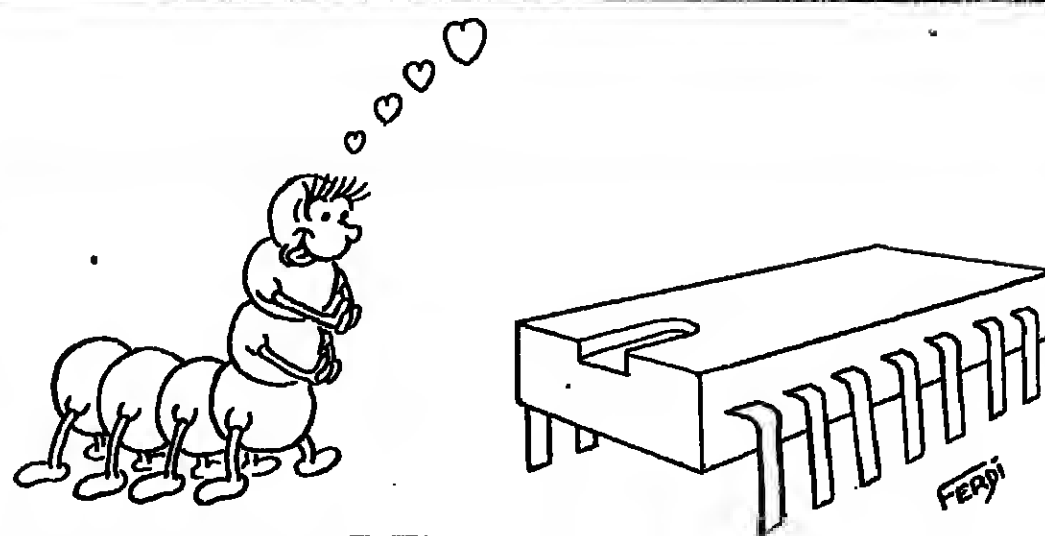
THE computer retailing trend is gathering pace, with the news that another shop is to be opened shortly, this time in Liverpool.

Opening at the end of this month, at 25 Brunswick Street, Liverpool, Microdigital is currently stocking up a wide range of products that fall into three main categories: dedicated task systems, general purpose microcomputers and support items.

In the first category will be such items as micro-based door bell systems and microcomputer games systems. In the second, Microdigital will be selling kits from Science of Cambridge and Lynx, handling the Mik 14 and Nascom 1 respectively. On the systems side it will have Apple II's the Casio general purpose system, and the Star Interactive booking system, running on Mael 2000s.

Support items will include packaged software from a variety of sources, including programs produced in-house, literature and assembly equipment.

The company is being run by Bruce Everiss and his brother Alan, whose main task will be to build all the kit demonstrator models. This way they hope to face and overcome the common assembly problems.



## GECS to stay out of any US deal

WHICHEVER US semiconductor manufacturer the GEC group finally deals with in its efforts to establish a joint venture operation, the move will not affect the position of GEC Semiconductors as the company's lead house for custom-designed LSI circuits.

This was made clear last week by Chris Turner, director and general manager of the company. There are no plans for GECS to enter the standard product market, where it accepts the fact that it would be impossible for it to compete. But the GEC group was obviously interested in the opportunities, and was therefore looking at the possibility of participation with an established company.

Although there is no formal corporate policy decision by GEC, Turner implied that any joint venture operation would almost certainly have a UK manufacturing operation.

This, according to Turner, was because it would be unlikely for GEC to want to invest in US technology and leave that technology solely in the US.

Although the company is not short of financial resources, starting a "greenfield" operation to compete in more than one product area for the world standards market would take a great deal of money over a considerable period of time.

The one company that GEC has been known to be talking to, Fairchild Semiconductor, has no existing UK production facility or any European facility either. The prospect of collaboration with GEC is therefore obviously tempting, in that it might offer Fairchild the chance to establish a European base.

But, considering the costs involved — there would be little change out of £100 million in all probability — GEC's reticence in commenting on just which companies it is talking to inevitably opens the way for speculation on other possible candidates.

These will obviously include the US manufacturers with UK operations, such as Motorola, National Semiconductor, Texas Instruments and General Instruments Microelectronics, all of which are well entrenched in the mass market. The first three would possibly be too big for even GEC to swallow easily. GIM, however, is smaller, and complements GECS in several areas in that it has considerable expertise in custom design work and is a competitor in the telecommunications market for such devices as push-button telephone dialler chips.

A spokesman for GIM, however, has categorically denied any talks having taken place with GEC.

GEC itself is now operating

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## The shape of galaxies

SCIENTISTS at IBM's Watson Research Centre in Yorktown Heights, New York, have been using a 370/168 to test a new theory about the formation of spiral galaxies. Computer simulations have been run to find whether the shape of galaxies is brought about by the redistribution of matter in large numbers of superimposed explosions and as predicted by the simulations, the results are surprisingly well matched.

The evolution of the galaxy M81 was modelled according to the theory over a span of several hundred million years.

and then a plot of star positions was made and superimposed on a present-day photograph of the galaxy, showing that the theory has a lot going for it.

Says Dr Geroles, "Our work lends support to some recent results that seem to suggest that the formation of spiral galaxies may be a very common phenomenon in our own and other galaxies."

## Add-on board for Pet

A SINGLE add-on board may soon be available from Commodore for its Pet personal computer that extends the memory capacity up to 40K bytes. This provides 31K bytes of user memory, space and, with other language compiler or interpreter to be up in addition to the standard Basic interpreter in the machine.







# New light on Honeywell relationship with NEC-Toshiba

WHILE the Fujitsu and Hitachi strategies for entering the world computer market are fairly plain, those of the other major grouping, NEC-Toshiba, have been clouded by their relationship with Honeywell and are difficult to discern.

The two companies developed a joint computer line, Acons 77, based on Honeywell's Series 80, but Toshiba has now effectively withdrawn from the large computer business and NEC is building the full line.

A joint company, NEC-Toshiba Information Systems, has been formed in which NEC has 60% and Toshiba 40%. Toshiba's manufacturing facilities have not been included, but they are now effectively confined to refurbishing machines which come back from JECC, the Japan Electronic Computer Co.

In Japan, JECC is the sole rental agency for locally-built machines, buying them from the manufacturer and thereafter taking all the lease income itself. If a machine is returned before the contracted period of the lease, JECC requires the manufacturer to buy it back.

Unless these returned machines are refurbished and put back on the market they would be a dead loss to Toshiba, but the company has ceased to build new machines.

NEC has been a Honeywell licensee since 1962; computers are about 20% of NEC's business and the company has 11% to 12% of the Japanese market.

Toshiba signed a licence agreement with GE in 1963. Honeywell took them over when it acquired GE's computer business in 1970. Computers are only about 5% of Toshiba's business and the company has about 5% of the Japanese market, giving the combined NTIS about 17% just behind Fujitsu.

"NEC developed the Honeywell 2000 line beyond our limits at the top end and had far more customers than we did," said Duke Sterling, Honeywell vice-

president for Japan. "As a result they have developed Level 64, which runs 200-2000 software, further than CII-Honeywell BIII, in order to satisfy these larger users."

There are eight models in the Acons 77 line. At the bottom end, the 77/200 is based on the Italian-built Level 02. The 77/300 and 400 match the CII-Honeywell Bull Level 64, and the 77/500 is an enhanced version of Level 64.

The French and NEC started to work together on this: it was a project called P7A. But CII-HB pulled out of the project and

"The reasons that we killed the 66/85 were purely economic," Sterling insisted. "IBM came out with the 3033 and it became clear that all the costs involved in putting into production a completely new processor which was only twice as powerful as the 66/80 just were not worth it, especially since the life span of the product seemed likely to be fairly short."

The principal differences between the 66/85 and the 77/800 and 900 are that Honeywell was planning to use CML-1 micro circuitry, which requires water cooling, whereas NEC and

allowed Honeywell time to rethink its strategy may well have been a blessing in disguise. Such setbacks are anyway hardly rare in the computer industry. IBM cancelled FS, Burroughs dropped its B6700. Unifac shelved its plans to merge 1100 and 90 series into a united line and Siemens has just dropped its plans to add a 7.770, taking instead the Fujitsu M-1801.

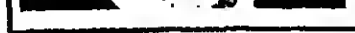
The Acons 77/800 and 900 were announced in Japan long before Honeywell announced the 66/85 mainly in order to have something to bid for existing cus-

adaptations, but the costs of building up spares, and training people on maintenance would mean that it was not worth bringing them into the US if they were going to be replaced in less than five years.

For the same reasons, Honeywell does not expect NEC to try to market the machines in the US in competition with Honeywell, although the possibility that they might be sold to a few large multi-national Honeywell accounts, which also have machines in Japan, has not been ruled out.

The agreements with NEC

FEW areas of Honeywell's computer business have been surrounded by as many misconceptions and wild rumours as its relationship with its two Japanese partners, Nippon Electric Company and Toshiba. In order to find out the facts, Tim Palmer visited Duke Sterling (pictured left), vice-president of Honeywell's Japan, Mexico and Canada division.



## Putting Japanese threat into perspective

MUCH has been written and said about the Japanese threat to the US computer industry, but a close examination of the businesses of NEC and Toshiba puts the threat into perspective.

Neither company makes a profit on its computer interests, and they are selling into a saturated mainframe market. The arrangement under which machines have to be sold to JECC for onward leasing relieves them of the necessity of building up large local sales forces of their own, but at the same time requires that their market share grow rapidly each year, because the minimum JECC lease contract is only 16 months.

The Japanese market is about 12% of the world computer market, and local manufacturers have 57% of this. But Toshiba's 5% share means that it has a deficiency 0.6% of the world market, and explains why it decided to pull out of the business.

NEC, which after Fujitsu has been the most

visible of the Japanese manufacturers, is now well placed to become the counterpart to the Fujitsu-Hitachi combine, since MITI, the Japanese ministry of trade and industry, wants two Japanese computer lines, one IBM-compatible and the other not. Its 12% of the Japanese market implies about 1.8% of the world market, now boosted by Toshiba's share. Even so, it only spends about \$45 million on research and development annually, which is much less than its US counterparts, less even than is spent by ICL, which gets its R&D on the cheap by doing it in the UK.

But the present cost involved in preparing documentation, training personnel and setting up maintenance facilities make it almost impossible for NEC to enter the world mainframe market in its own right.

Why then are the Japanese companies establishing subsidiaries in the US? The explanation may be more defensive than offensive — that all the major US manufacturers are selling hard in Japan, and they need a source of

first-hand intelligence on developments in the US in order to stay competitive in their home markets. The big missed opportunity for the Japanese was the failure to acquire any of the US companies which pulled out of the business. Toshiba had links with GE, and Hitachi with RCA, and Xerox and Singer were also allowed to slip away.

By following a closely IBM-compatible route — and harnessing the genius of Gene Amdahl, Fujitsu does have the potential to become a major force in the world market, and Hitachi, following a similar route and taking ICL as a partner is also well placed.

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instead adopted P7G, which is to be compatible with both Level 64 and the lines inherited from CII," commented Sterling.

The 77/800 is approximately equivalent to a 66/40, and the 77/700 to a 66/80. The 77/800 and 900 are the fruits of a joint development project between Honeywell, NEC and Toshiba.

"We worked together on the conceptual design, and they have made changes since. The machines are what we announced as the 66/85 and then cancelled.

Toshiba use air-cooled CML-2s. "We are buying some CML-2 chips for future products. The other main difference is that they use a different input-output processor from ours."

The cancellation of the 66/85 was regarded as a major setback for Honeywell, but it is an open secret that the company is working on a successor to the Level 66 line and, in view of the comparatively small power improvement it offered, the difficulties with the CML-1 circuit chips which delayed the project

tomers within the government. It has been suggested that Honeywell might, perhaps indeed should, take the Japanese machines as a stop-gap, but Sterling is adamant that this is not really a viable option.

"The machines are basically compatible with ours, but the communications are different because of their system of networking, and the operating system has been adapted to Kanehara.

"It would only take man-

and Toshiba consist of licence agreements extending to 1982 and exchanges of technical expertise extending to 1979. Neither agreement is expected to be renewed, but it is likely that new agreements will be signed in such areas as semiconductor.

"Apart from licence payments, we have had a few software products from our Japanese partners. We got our PL/I compiler for Level 60 from Toshiba and a Cobol package from NEC. We took 30 and 60 Megabyte disc drives from NEC for Level 61 and Level 62 and the prices are very competitive even against those quoted by Magnetic Peripherals Inc's Portuguese factory."

MPI is a joint venture on disc production with Control Data in which Honeywell and CII-HB have 30%.

"Otherwise, NEC is a major source of components, although not a sole source for any item."

Outside the mainframe area, Toshiba remains in the minicomputer, office computer and peripherals markets, while NEC has just adopted Honey-

"We are now negotiating to buy the division of MOM which markets our products," said Sterling.

"The new company is due to be formed in August; we will have 80% of the shares and MOM will have 20%. Because of support from Mitsubishi will be the new president of MOM and the company will employ about 200 people."

"We will be selling Level 61, Level 64, and Level 66 machines to replace the 6000s MOM has sold, through the new company. "The machines will be imported from France and the US; the Japanese tariff against imports is still tremendous, but it is nevertheless just worth being in business there."

Overall, how does Sterling see Honeywell's collaboration with its Japanese partners?

"Up to 1974 or so, the flow of information was all one way, since then NEC and Toshiba have had engineers in our plant collaborating on development projects. They came ostensibly to learn, but they were quality engineers and have made significant contributions."

## Calls for papers

PAPERS are solicited for SECCO 79, a symposium and exhibition on Environmental Engineering Technology to be held at the Royal Society Conference Centre, London, on May 1-4, 1979. The event is sponsored by the Society of Environmental Engineers and Technicians (SEETT) in conjunction with its 20th anniversary. Papers will be selected for the symposium in relation to the environmental problems of today and trends for the future. Details from the SEETT Secretariat, SEETT, 79, Old Hall, Barnet, Herts. EN4 8JF, Tel: 0452 71200.

15-18, 1979, in the New Theatre, London. The theme of the conference is "Options for a European Future". The Society of Environmental Engineers and Technicians (SEETT) is organising the conference in conjunction with the European Communities. Abstracts should be submitted by September 15 to the SEETT Secretariat, SEETT, 79, Old Hall, Barnet, Herts. EN4 8JF, Tel: 0452 71200.

Some of the gripes levelled against the banks is that they are slow and impersonal, and that bank statements arrive irregularly. As a result of an experiment at the Kinross branch of the Clydesdale Bank, all its branches will be linked into a nationwide system.

Laura Tatham looks at the system which promises, not only to give faster transaction processing at the counters and tighter management control, but also that cheques and paying-in slips will disappear. A record of each transaction will also be given.

# Writing of cheques soon 'thing of past' By Laura Tatham

MORE convenient banking, more personal service and better record keeping are among the services Americans most want from their banks according to a recent market survey by Citicorp, New York's largest banking company. Britons, who by now suspect that the long promised real time Utopia is a figment of the clearing banks' imagination would, no doubt, express similar views if consulted.

Customers of Scotland's Clydesdale Bank (a wholly-owned though largely autonomous subsidiary of the Midland) will soon be luckier than most of us. The outstanding success of a pilot scheme now in operation at two branches marks the start of a project that will put even the most remote of its 368 branches online via a total of 1,500 terminals linked in a countrywide network.

Faster, more accurate transaction processing at counters and tighter management control will not be the only benefits that Clydesdale will derive from its Autobank system. For customers, its most attractive features are likely to be that the writing of cheques for their own withdrawals and of paying-in slips will be a thing of the past; that a single magnetic stripe plastic card will be the passport not only to their services such as cash dispensers.

reached a position of stalemate. Derek Gall, manager of the bank's automation and research department, had formulated very clear ideas about system performance and was convinced that his criteria could be met only by equipment and software more advanced than those designed in the 1960s.

Discussions with several mainframe companies, however,

considerably more sophisticated than any yet announced by any major British or American clearing bank, has directly benefited by the caniness with which it has approached computing in the past. Having, until now, remained aloof from any but comparatively primitive batch operations, it has been able to cash in on the advantages now available through the use of minicomputers and other low cost components.

As a result, though Autobank will incorporate a remarkably comprehensive range of facilities and fail-safe features, its total cost will be less than half of that of a more conventional solution.

The Autobank communications network will incorporate 16 Univac V77 minicomputers. These, installed in pairs at seven regional centres and at the bank's head office and computer centre in Glasgow, will cover the whole of Scotland. Each V77 will serve a group of 15 to 20 dedicated telephone lines to each of which a total of up to 18 terminals in several branches will be connected. For the pilot scheme, pairs of V77s have already been installed at one regional centre and at Glasgow.

Special hardware and software, designed by Lion Systems Developments of High Wycombe, automatically switches the lines served by one V77 to its partner if it develops a fault, and

reverts to normal after the fault has been rectified.

Software added by Univac to the V77 Vortex operating system causes each computer to dump all the records it accumulates onto the disc of its partner at one-second intervals. Service will therefore continue without interruption if one processor goes down, though response time may be slightly slower than the normal 1.3 second average.

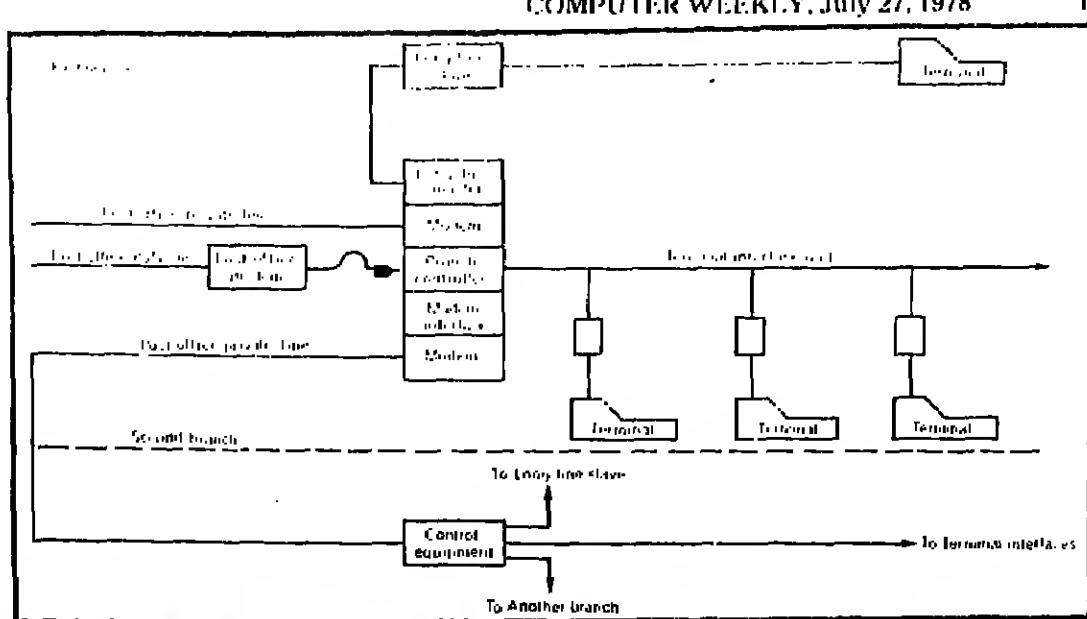
Before Fortronic, a small young Scottish firm and a customer of the bank, demonstrated its ability to produce a purpose designed low-cost terminal, the Autobank project had

For customers, the most attractive features are likely to be that the writing of cheques for their own withdrawals and of paying-in slips will be a thing of the past; and that a single magnetic stripe plastic card will be the passport not only to these but to other services such as cash dispensers.

you satisfy our criteria we promise to place a substantial order." Similar challenges were offered to the other suppliers, who subsequently participated in the Autobank scheme.

The Fortronic terminal is about the size of a portable typewriter and much lighter in weight. It incorporates a magnetic card reader, calculator-type keypad and control keys, a 16-character visual display, tally-roll printer and micro-processor. A linked keypad is placed on the customer's side of the bank counter and both are connected to a terminal interface unit.

Each dedicated telephone line from the regional V77 minicomputers serves several terminals. Between the line and the terminal interface is a combined branch terminal controller/modem. This is designed for two-wire S1 lines but is capable of upgrading to four-wire S3



The system flow chart shows the configuration that will be installed at each of the Clydesdale Bank's branches. An interesting point is that the system uses both ordinary telephone lines and the S1 lines.

drew a blank. "Impossible, either in your timescale or at the price you are prepared to pay" was their unanimous verdict. The cost of 1,500 terminals at a minimum of £2,000-£3,000 each was, of course, a major obstacle.

Fortronic — a company that since its inception in 1970 has looked for organisations with problems rather than marketing standard hardware and software — accepted the challenge to design and manufacture a terminal that fulfilled all the bank's requirements and would cost under £1,000.

Sentimentality and rash speculation are not characteristics traditionally associated with Scottish bankers and the directors of the Clydesdale are no exception. Though patriotically pleased at the prospect of employing native knowhow and enterprise, they were prepared to do this only on a shared risk basis.

"Work out a solution and install prototypes at minimum cost," they told Fortronic. "If

lines if this is necessary to improve response time. Designed and built by Lion, this control unit, which also incorporates diagnostic indicators, is compact and low-cost. Its function is to scan each terminal for a "request to send" signal and, on receiving this, to lock out the others until the message is complete. It also controls incoming computer messages. Using other special equipment, very small branches will operate as slaves to the nearest larger ones.

At Kinross, one of the two pilot branches, a customer wishing to make a withdrawal or pay-in passes his Autobank card to the teller and names the type of transaction. After he has entered his personal number on the keypad beside him, the teller initiates the routine through the terminal and checks the customer's identity via its card reader. She then enters the amount including, where appropriate, the denominations of notes and coins.

After verification by the terminal the input data is transmitted to the regional V77. A duplicate record is printed on the terminal tally roll — one copy for the customer and the other for retention. All transactions

tion detail is logged by the regional computer and remains available for interrogation. In consequence, day-end cashing up is now a quick and simple job for tellers.

Regional data is also transmitted to the head office V77s which accumulate it on magnetic tape. After closing hours, these tapes are transferred by hand for batch processing on the bank's mainframes.

All the Univac V77 control functions are handled by the standard Pronto transaction processing software slightly enhanced to accommodate the Fortronic terminals and other special requirements. This, operating under the Vortex multi-tasking operating system, has contributed greatly towards the remarkably quick development of Autobank.

In a short space, it is difficult to describe the other fallback measures so it can merely be stated that these leave no loopholes. Additional control of the network is provided by a facility that may well be unique — a video terminal at head office which permits monitoring on all lines and, if considered necessary, redistribution of traffic.



When the transaction has been completed, a duplicate record is printed on the terminal's tally roll. One copy is given to the customer and the other is filed. The details are also logged by the regional computer. This feature makes cashing-up a quick and simple operation.

INTERACTIVE computer graphics for engineers is the title of a three-day course to be held at the University of Lancaster on September 25-27. It is intended for engineers already experienced in the use of computers. Details from the Computer Graphics Course Secretary, Dept. of Engineering, The University, Lancaster LA1 7RH. Tel: Lancaster 05060 — ask for Engineering Department.

A BASIC skills division programme has been designed by Infotek to provide training in the fundamental skills of programming any systems development. Beginners can choose either Cobol or PL/I basic training and for more specialist and complex programming, QSL/CL and CICS training is available. Further details contact Infotek International on Midland 8031.

A COURSE for the management of scientific departments has been organised by Kendall-Sheila. It will take the form of a series of two-day seminars spread over a period of months, the first being held on October 5-6, and the last in May 1980. Details can be obtained from Mrs Veronique at the College, Slough 34885 ext 48.

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Contact: Andy Wright

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Since JBA commenced this service we have been extremely successful in arranging a selection of possibilities for people arriving there (mainly in Sydney and Melbourne) and the people concerned thereby found ideal employment very quickly. Contact: Mike Creamer

## SENIOR SYSTEMS ANALYST SLOUGH

relocation expenses

near A4/M4

starting salary around **£7,500**

LARGE IBM 370's  
IN EUROPE

SUCCESSFUL MULTI-NATIONAL  
COMPANY

INTERESTING NEW  
SYSTEMS DEVELOPMENT

EUROPEAN  
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DISTRIBUTED  
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EXCELLENT SALARY  
SCALES

PLEASANTLY SITUATED  
MODERN OFFICES

GOOD TRAINING AND  
CAREER PROGRESSION

LARGE COMPANY  
FACILITIES AND BENEFITS

### RESPONSIBILITIES

1. Development and implementation of inventory control and distribution systems
2. Staff Control
- NB: The post will involve travel

### REQUIRED PROFILE

1. 6-7 years' DP experience including programming
2. Proven ability in all phases of project development
3. Ideally experience of project control and knowledge of IBM 370/158 and mini-computers



Crown House Morden London SM4 5EU  
consultancy division  
**01-540 8311**  
24-hour answering service

## Iran-the turning point for Data Processing Experts

In a country where the emphasis is very definitely on the future, Bell Helicopter International are supplying a logistics and training support service to the Imperial Iranian Army Aviation.

It's an ambitious project, demanding extensive data processing facilities and a large integrated data base, housing the highly flexible Honeywell 6000 system, has already been established. Consequently, the wide cross-section of DP talent we require will certainly find two years' in Iran time well-spent.

£11,200-  
£12,400 p.a.  
tax-free

### Programmer Analyst

Four years' experience with at least two years of recent Honeywell experience, utilising COBOL 68 and Integrated Data Store (IDS) programming language is required.

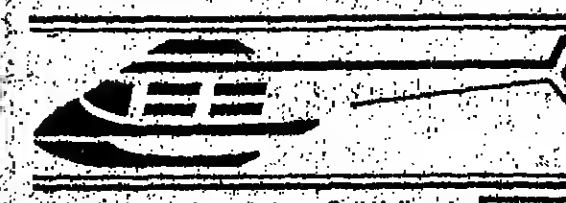
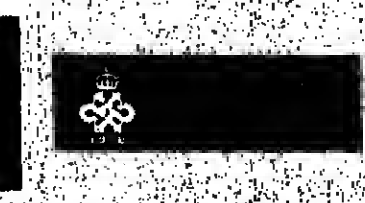
### Data Base Analyst

Two years' recent experience in designing and maintaining data bases, utilising IDS utilities is required. Knowledge of IDS internals is desirable.

As part of the Bell Helicopter International team, experience isn't the only benefit you'll derive from a two-year contract. Culturally, you'll learn a lot in a country which manages to blend history with a very progressive outlook, and where you and your family can live comfortably in a balanced climate.

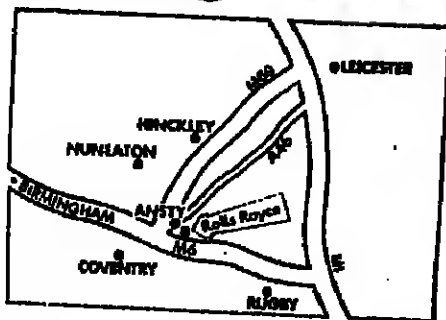
Financially, you'll receive a tax-free salary, a housing supplement of £365 per month plus a child allowance of £480 per month accompanied. Generous relocation expenses will help you make the transition from the UK and there are also free flights home with leave arrangements.

There's nothing to lose and plenty to gain from spending two years in Iran, so write with brief cv quoting ref. no. 337 to Ian Gregory, IAL, Aeradio House, Hayes Road, Southall, Middlesex, Tel: 01-874 5021.





# Pointing the way to some highly challenging posts.



## Systems Analysts & Programmers.

The Industrial and Marine Division of Rolls-Royce is world renowned for pioneering developments—adapting gas turbines for non-aero applications. Which brings us head on with some very exciting work. Joining a dynamic team developing and supporting business information systems could provide you with some very heady experience too.

Let's be specific: we need new teams to help develop new projects in Production, Spares and Accounting areas. You would have the stimulation of close involvement in joint approaches to new designs, the satisfaction of devising solutions to a whole variety of problems and achieving tight and challenging timescales.

Programming is in COBOL. The equipment is ICL 1900, with investigations currently underway on hardware replacement strategy. User input is all keyed-in via VDU's, which also provide access to daily updated enquiry files. The installation is operated 7 days a week, around the clock.

Appropriate hardware resilience has been incorporated.

We want people at all levels. If your experience is limited, we will happily train you as fast as you can take it. But we must point out you won't be offered a job unless you can prove your ability.

Because you'll be important to us we'll reward you well. With a competitive salary. By overtime pay.

As for where you'll live, like most of us here, you'll find Nuneaton, Hinckley, Leicester, Rugby, Coventry, Leamington and Warwick ideal. Generous assistance with relocation expenses will be given where appropriate.

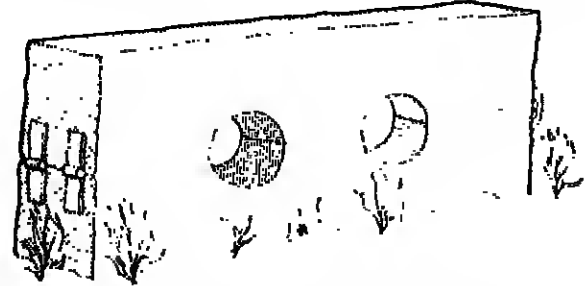
Apply now. We've all the signs of being the challenge you need.



Telephone (reverse charges) or write for an application form to Mrs K Brown, Personnel Dept., Rolls-Royce Limited, Industrial & Marine Division, PO Box 72, Ansty, Coventry, CV7 9JR. Tel: Coventry (STD 0203) 613211, ext. 60.

Rolls-Royce Limited, Industrial and Marine Division

## Stocks but no Shares?



If you feel trapped, with no room to move, and are not getting your fair share of interesting DP work, then a career with South Yorkshire could be what you're looking for.

### Senior Systems Analyst

Post Ref T248 Grade S01/2  
Salary £5232 — £6010 (Inclusive of supplement).

### Systems Analyst

Post Ref T255 Grade AP4/5  
Salary £4245 — £5073 (Inclusive of supplement).

### Programmer

Post Ref T286 Grade AP4/5  
Salary £4245 — £5073 (Inclusive of supplement).

We can offer careers with real variety, developing an extensive range of systems for all departments of the County Council.

Our IRL ICL 1904S with more than 50 terminals operates on the George 3 system. This configuration is shortly to be enhanced to 250K with additional peripheral equipment. Further development involving the use of terminals is planned, and where applicable new techniques will be introduced to assist in the implementation of these applications, and any necessary training will be given to ensure that sound, practical solutions are found.

We can offer tremendous scope for those interested in a career in a varied and stimulating environment giving experience of real time systems, on line programming, and data base techniques.

The County Council operates a system of flexible working hours, and payment of removal expenses, lodging and travelling allowances will be made in appropriate cases.

Please write or telephone for an application form quoting the appropriate post reference to the Chief Executive, (Personnel), South Yorkshire County Council, County Hall, Barnsley, South Yorkshire S70 2TN. Telephone Barnsley (0226) 06141 Ext 2401.

Closing date for applications is 0th August 1978.

**South Yorkshire County Council**  
ENERGY IN ACTION



## B.I.C.C. TELECOMMUNICATION CABLES LIMITED

### Analyst Programmer

Up to £5,346 + bonus

BICC Telecommunication Cables Limited is an operating company within BICC Limited, which is a British based International Organisation employing over 64,000 people in the U.K. and Overseas.

An Analyst Programmer is required for the Computer Systems and Data Processing Department at Prescott Cables. This is a manufacturing unit with its own Technical and Services organisation, employing some 760 people.

The computer configuration includes a Control ICL 1904S with magnetic tapes and discs operating under George III. An ICL 2800 with on-line terminals has just been commissioned and the successful candidate will be involved with re-developments for the new machine.

Applicants, male or female, should have at least two years' COBOL programming experience, preferably with ICL machines. Systems experience would also be an advantage.

The post carries a progressive salary range from £4,229 to £5,346 p.a. plus an annual productivity bonus of up to 7.5%. Career opportunities in the computer function extend across the whole of the BICC Group. A first-class pension scheme has been long established.

Prescott is convenient to the cities of Liverpool and Manchester and is within easy access of North Wales and the Lake District. A modern and well equipped Social and Athletic Club offers plenty of scope for leisure activities at Prescott itself.

Please write to:

Stan Lord (ref. SA24/109)  
BICC Telecommunication Cables Limited  
P.O. Box 1  
Prescott  
Merseyside  
L34 6SZ



## DATA CONTROLLER

Can you combine a proven flair for detailed work and full responsibility in customer?

Send C.V. to

Managing Director  
**WIGNORE DATA SERVICES LTD.**  
4 New Building Street  
London W1X 1PE

## oxford polytechnic

### Principal Systems Analyst

(POA £5,721-£8,242)  
The analyst will be responsible to the Registrar for setting up and maintaining a comprehensive management information system for the Polytechnic.

Applicants must send their particulars to be considered for the post to the Registrar, Oxford Polytechnic, Oxford, OX4 0DQ.  
Closing date 28 August 78.

### COME WEST

We have the best of both worlds

A more leisureed and relaxed way of life, plus the challenge and rewards of working for go-ahead expanding companies.

We are currently recruiting for ALL levels of Data Processing staff, who wish to live and work in this delightful area of the country. Salaries are entirely dependent on experience and range from £3K to £8.5K.

For further details in strict confidence write or phone:

**Walker-Weston Associates Limited**  
Specialists in Computer Recruitment  
Woodlands, Lower Bristol Road, Bath  
Avon. Tel. Bath 317830

## ALL OVER BRITAIN WE'RE GIVING YOUR ADS AN AIRING!

LBC, Capital Radio, BRMB, Piccadilly, Radio Trent, Radio Clyde, Swansea Sound, Radio Tees... on all these stations, powerful peak-time commercials will be reminding computer people that the computer jobs are here, on Computer Weekly's classified pages. Our classified ads reach some 16,569 systems analysts, 20,443 programmers, and 9,664 operators. From now on, they'll be pulling in still more... at by far the lowest cost-per-thousand rate in the computer press! (12p per single column centimetre per 1,000 readers. The rate of nearest competitor is 16p.)

To hear more, contact Brian Durrant on 01-261 8000 or 01-261 8028/8658.

## COMPUTER WEEKLY

01-261 8000



## Abraxas Recruitment Division

**ABRAXAS**West End House  
11 Hills Place  
London W1P 1AG**01-439 8891****OPERATIONS**  
**ICL & IBM BURROUGHS PDPHONEYWELL****CLERICAL OPERATORS** An exciting position has arisen for an operator who wishes to progress in programming or technical support. Experience in either DECOS or OS 2000 will be acceptable. Good large company benefits.**DATA CONTROL** £4,500-£5,000 Experienced Data Control Clerks are required for various installations/hardware at both Junior and Senior levels. Salaries vary with age and experience but range between £3,000 to £5,000. Ring Abraxas now for details of vacancies in your area.**JUNIOR OPERATORS** £3,000-£4,000 CITY/C LONDON Several vacancies exist for keen Juniors with 6 months + experience. Salaries vary according to age and qualifications. ICL 1900/2900 or IBM 360/370 required. Excellent training offered and early promotion will follow. Applicants must be aged 19+ and prepared to work shifts.**DATA CONTROL** £4,500-£5,000 OS/VS1 experience is currently much sought after by many companies situated in and around LONDON. Salaries are highly competitive together with many varying company benefits. Mortgage subsidies, travel concessions, Life Assurance, Restaurants/V.I.S. and BUPA. Contact Abraxas for further details.**SUPERVISORS** £4,500-£5,000 LONDON Applications are invited from candidates with ICL 2900/1900 experience. Either GEORGE II or III preferred. A strong commercial background, the ability to handle effectively and some supervisory experience are all necessary qualifications.**FOR VACANCIES IN YOUR AREA PLEASE RING ABRAXAS NOW****Abraxas Computer Employment Ltd.**ULSTER COLLEGE  
THE NORTHERN IRELAND POLYTECHNIC  
Faculty of Science  
SCHOOL OF COMPUTER SCIENCE**PRINCIPAL LECTURER**  
**IN COMPUTER SCIENCE**

The person appointed to this post will, in addition to teaching to honours degree level, be expected to play a leading role in co-ordinating the data processing research activities within the School of Computer Science. Applicants should be honours graduates with appropriate postgraduate experience. Candidates should state their teaching and research interests.

**LECTURER II IN**  
**COMPUTER SCIENCE**

Applicants should have a good Honours Degree and/or a Professional Qualification. The duties of the post include the organisation and teaching of courses in the School of Computer Science; the successful candidate will also be encouraged to participate in the development of research and post-graduate work. A background in data processing together with previous teaching experience, will be considered an advantage.

Salary Scales: Principal Lecturer £7047-£7818/£8644  
Lecturer II £4101-£5558

The Polytechnic is a direct grant institution with an independent Board of Governors. It opened in 1971 and now has a student population of some 7,100. It has extensive new purpose-built accommodation including 750 residential places on the 114-acre campus overlooking the sea at Jordanstown, a pleasant and quiet residential area. There is a scheme of assistance with removal.

Further particulars and application forms, which must be returned by August 14, may be obtained by telephoning Whiteabbey 02341 86131, ext. 2243, or by writing to the Establishment Officer, Ulster College, The Northern Ireland Polytechnic, Shore Road, Newtownabbey, Co. Antrim BT37 006.

**Production Control Systems**  
**Reading / Leicester**Please apply to: **Mr. J. Harrison**Please apply to: **Mr. J. Harrison****£4,000-£6,000****Senior Programmers****Senior Programmers / Analysts****Senior Analysts****Project Leaders****£6,000-£7,500**

Safe Computing is one of the fastest growing software houses in the UK with offices in Leicester, Birmingham, West Bromwich and London employing over 170 staff. The company is now opening a new division in Reading to service the south of England.

Safe Computing specialises in production control and its package, SeFeS (Small Factory System), is the most successful product currently available in the UK achieving over 60 sales to date.

Other software packages include SOLAR, a ledger accounting package, SOFA, a market leader in solving inflation accounting problems, and SCIRT, a job costing system.

Experienced systems and programming staff are required to install and develop these packages. These staff will be based in Leicester or Reading but may be required to travel throughout the UK, Europe, or further afield.

The jobs available within Safe Computing are for those interested in applying minicomputer solutions in a practical business environment. There is plenty of opportunity for customer contact and supervision of projects through to completion.

To apply for these positions, please contact:

**Mike Harrison, John Evans or John Gibb**

at Leicester (0533) 29321 or write, giving brief details of your career, to:

Mike Harrison, Safe Computing Ltd., 20 Freeschool Lane, Leicester, LE1 4FY.

**RECRUITMENT**  
**MANAGER**

Salary Negotiable

Square One Computer Services would like a RECRUITMENT MANAGER to fill a key role at their Head Office in Chesham.

He/she will be active in the definition of recruitment budgets and be responsible to the Directors for the recruitment and selection of permanent consultancy staff. Ideal candidates will have had a technical computer background and currently be involved in the recruitment of systems and programming staff. Any additional experience of other personnel functions would be of advantage. Salary is negotiable and company benefits include a profit sharing scheme. Relocation expenses would be considered.

If you would like to discuss this requirement, contact PAUL HILL, Director Square One, on CHESHAM (02405) 74161. If you prefer to ring in the evening, leave a message on our answering machine.

**none****SA** Computer Services Association**If you're in Systems and know**  
**what improving business**  
**performance is all about,**  
**we would like to meet you****SENIOR SYSTEMS ANALYST - North West**

BOC Gas Equipment are world leaders in the manufacture of gas welding products. We have a vital and well organised Systems Department contributing substantially to business performance. We are now looking for an ambitious person to help maintain and accelerate the momentum of the Department.

We have recently introduced several advanced on-line systems, concentrating on sales, order processing, stock control and integrated accounting. Much of our success can be attributed to appointing User Project Managers within any functional department for whom we develop a new system. The next phase of development will embrace manufacturing control, sales forecasting and purchasing.

Responsibilities will include identifying systems' solutions to business problems, appraisal and selection of concepts and resources, together with cost-effective control of systems development.

You will be supported by professional Systems Analysts and Software houses as needed. Current operations, which include maintenance programming.

facilities and systems co-ordination, are based on a large Datapoint S500 with facilities for processing on an IBM 370/158.

To be successful in this appointment you will need sound experience of setting up and developing systems. In a similar environment and be fully committed to a profit conscious approach, aimed at improving business performance. It is unlikely that anyone with less than five years' experience will have the necessary background.

We are located in the North-West of England at Skelmersdale, where housing is reasonably priced both in town and country and with good access via the M6 and excellent rail links to other parts of the country. The salary will be very attractive to the right person and where appropriate, relocation expenses will be paid.

For further details and a chat about this challenging opportunity, telephone Ian Pearson, Systems Manager, on Skelmersdale 24124 or write to him at BOC Limited, 2 Peel Road, West Pimbo, Skelmersdale, Lancs.

**Engineering Division****CONTRACTS****At least 2 years' OPERATIONS experience?**  
If you are a freelance operator now, or intend to go freelance in the near future, contact us for details of our current and future assignments in all areas of the U.K.**IMMEDIATE****OS JCL Writers**  
**BURROUGHS 1700 OPS**  
**IBM OS VS1/2 OPS**  
**HONEYWELL GCOS OPS**  
**DATA 100 OPS**  
**ICL SYSTEMS 4 J. 1800 OPS**  
**IBM DOS VS POWER OPS**  
**Q3 Job Set-up/Data Controller**  
**for Senior Position**  
**DDE/PUNCH/VDU OPS****FORTHCOMING****HONEYWELL OS 2000 Ops and**  
**Senior Ops and Shift Leader for**  
**one-year contract. Top rates and**  
**bonus.****IBM OS VS POWER OPS**  
**ICL Q2+ & DME OPS**  
**ICL 2960 VMES OPS**  
**HONEYWELL GCOS OPS****PHONE 01-439 6481** (24 hour answering service)  
for more information or send the coupon below for immediate attention**EFFECTIA GRAVIS****NATIONAL HOUSE, 85 WARDOUR STREET, LONDON W1V 3HP**  
**COMPUTER PERSONNEL CONSULTANTS LICENCE NO. SE(A)62**

CW27/1178

**MORE JOBS THAN EVER!****JUNIOR PROGRAMMERS**  
**£3,000 to £4,300**S.E. ENGLAND  
You have only 1 year's commercial experience? Then you are in great demand. We have a large selection of freelance companies who need people like you. Some offer mortgage assistance to the right candidate after short period with them.  
CW30/1 Patrick**SUCCESSFUL SALESMEN**  
**To £14K quota earnings**U.K.  
We now have six different firms for both hardware and systems only companies who are anxious to meet successful salesmen in this industry. All firms have bonus schemes and cars or car allowance. Most positions in S.E. England. Three in Midlands.  
CW30/2 Michael**TIME SHARING**  
**PROGRAMMERS**  
**To £6,800**C. LONDON  
If you have had time sharing experience involving the use of FORTRAN, BASIC or ASSEMBLER, then we have four nationally known companies who would offer you an exciting job in pre- or post-sale support. Some offer generous bonus schemes.  
CW30/3 Michael**USA--To \$30,000**  
**TELECOMMUNICATION**  
**EXPERTS**USA  
Three people with hardware or software T/P knowledge are urgently required by a New York firm. The machine experience you have is not as vital as the T/P experience itself. Please for details and interview.  
CW30/4 Michael**USA--To \$30,000**  
**TELECOMMUNICATION**  
**EXPERTS**USA  
Three people with hardware or software T/P knowledge are urgently required by a New York firm. The machine experience you have is not as vital as the T/P experience itself. Please for details and interview.  
CW30/4 Michael**USA--To \$30,000**  
**TELECOMMUNICATION**  
**EXPERTS**USA  
Three people with hardware or software T/P knowledge are urgently required by a New York firm. The machine experience you have is not as vital as the T/P experience itself. Please for details and interview.  
CW30/4 Michael**DATA EXPRESS HOUSE**  
**PROSPECT PLACE**  
**HEATHFIELD TERRACE**  
**CHISWICK W4 3NR**  
**Recruitment Consultants**  
**01-995 3663 or**  
**01-995 6188 evenings****SENIOR OPERATORS****c. £4,500 inc.**E. LONDON  
A banking organisation having a major IBM DOS/VS Power installation requires operators now. Nice perks include New C.P.S., S&S Club, Mortgage assistance and free restaurant.  
CW30/5 Patrick**OPERATORS/SEN. OPS.****£4,000 to £5,000 inc.**ENFIELD  
Work for an institution here to stay! All you need is 1 year + IBM OS experience. Parks include removal expenses. C.P.S. and paid overtime.  
CW30/6 Patrick**OPERATORS/****SEN. OPERATORS****£4,000 inc.**NR ASHFORD, MIDOX.  
A major Service Struggle with 2 locations needs ICL GII+ experienced operators. Parks include non C.P.S., 4 weeks' holiday. Salaries received in September.  
CW30/7 Patrick**OPERATORS****To £4,500 inc. + O/T**NR BRENTWOOD, ESSEX.  
A major IBM DOS/VS Power user needs operators urgently. Parks include relocation expenses, 22 days' holidays, C.P.S. plus weekend paid overtime.  
CW30/8 Patrick**FREELANCE****PROGRAMMERS****To £260 p.w.**PL/1 DOS VS Cw, 9 months  
IBM Assembler MVS, Exp. 4m  
ICL 2960 Cw, Luxembourg, 5m +  
Singer System 10 Assembler, Reading/Scotland, 9 months  
HON Cabot GCOS, Liverpool, 3m +  
+ LOTS MOREUNIVERSITY OF  
WESTERN AUSTRALIA  
Perth**COMPUTER SCIENCE**  
Applications are invited for appointment to:**SENIOR**  
**LECTURER**

In the Department of Computer Science, The University of Western Australia, the Department is seeking a Senior Lecturer to concentrate on the central areas of computer science: either numerical analysis or operations research or logic in the Department. The post of Senior Lecturer is a senior academic and professional position and requires a strong background in one of the above areas, together with a strong interest in the teaching of computer science. The successful candidate will be expected to contribute to the development of the Department and to the University as a whole.

The normal salary range for a Senior Lecturer is \$42,000-\$52,000 p.a.

Benefits include superannuation under the 1982 Act, leave to the 15th day of September and dependent family, medical insurance, study leave and long service leave and pension scheme. Further information including conditions of appointment may be obtained from the Human Resources Officer.

Applications in duplicate, stating full personal particulars, qualifications and experience should be sent to the Director, University of Western Australia, Perth, Western Australia, 6000, by 15th August, 1976. Candidates should expect three interviews to be held in the following order:

**ROBERT GORDON'S**  
**INSTITUTE OF TECHNOLOGY**  
ABERDEEN**COMPUTER**  
**OPERATOR/**  
**TRAINEE OPERATOR**

Applications are invited for the above post in the Computer Services Unit of the Institute which operates a GCOS system, 20 processing batch and on-line services. The Operator will be expected to have a minimum of 6-12 months' experience of equivalent and/or to have one year's computing experience. Applicants without the necessary experience will be considered for the Trainee position.

37 1/2 hour week. Local Government Superannuation Scheme in place. Salary Scale £7,118 to £22,770 per annum.

Applications, with a curriculum vitae and should be returned as soon as possible to the Chief Administrative Officer, Robert Gordon's Institute of Technology, Schoolhill, Aberdeen AB9 1FR.

**LECTURERS****help us to maintain our reputation as:**  
**The computer company you can understand**

We believe in making life as simple as possible for our customers. We provide them with commonsense customer training courses that are easy to digest with the minimum of jargon.

**Which is where you come in!**

We currently have vacancies for software and hardware lecturers at our South Harrow Training Centre where we teach both hardware and software courses to customers.

**Our software training involves:**

- \* Languages (high and low level)
- \* Operating systems
- \* Practical demonstrations
- \* 'Hands-on' programming problems

**Our hardware training includes:**

- \* Machine code programming
- \* 'Big picture' and logic level work related to mini computers, micro processors and associated peripherals.
- \* Practical work for programming and problem solving.

We would like you to lecture to customers (mostly on commercial languages and operating systems), prepare and maintain course packages and maintain a high technical knowledge. You'll teach mostly in the UK but occasionally throughout Europe.

We'd like to hear from you. You'll be offered a competitive salary and be eligible for an excellent pension scheme. Career prospects are first class.

Contact Janet Field at the address below:

**Data General**

Data General Limited, Westway House, 320 Ruislip Road East, Greenford, Middlesex UB6 9BF, Tel: 01-578 9231



# SET YOUR SIGHTS HIGH - REACH THE TOP!

★ Why not consider moving to a more rural area - relaxed country atmosphere

★ Take a step up the ladder - Learn new techniques - improve your prospects

★ Increase your salary - consider the perks

## MINI PROGRAMMER

Our client is a major British company with business interests in many areas. They seek programmers with at least 18 months' experience in BASIC + experience. This hardware is newly installed and thus offers a chance to become involved in the development from the beginning. Conditions -

- ★ Wide range of interesting and new projects
- ★ Flexible hours
- ★ Excellent career prospects
- ★ Annual Bonus
- ★ Salary £6,000

REF 158B

## MINI PROGRAMMERS

We would like to have from programmers on behalf of our clients, with good MINI exp. If you have had at least 2 years' experience of ASSEMBLER on any mini computer - contact us immediately to discuss on-going projects in the above countries

- ★ Accommodation and expenses paid by company
- ★ Renewable assignment
- ★ Excellent scope in a variety of areas
- ★ Salary £12,000 neg A.E.

REF 1603

## ICL PROGRAMMERS

Due to development of their advanced computer systems, successful O.P. services dept seeks to boost its programming team. Requiring large ICL 1900 equipment they offer excellent opportunities for persons with minimum 2 years' ICL COBOL & PLAN experience

- ★ Training on IOMS Database
- ★ Development to analysis
- ★ Opportunities to join at SENIOR level
- ★ Applications in various areas providing an absorbing and interesting career
- ★ Excellent perks include flexible working hours 8 WEEKS' HOLIDAYS
- ★ Salary to £5,500

REF 1649

## SYSTEMS ANALYST PROJECT LEADER DESIGNATE

International company engaged in manufacturing, distribution and sales of well-known commercial products, seeks a person with design and implementation of all their stock control, order processing, warehousing or sales forecasting systems in an IBM environment. He or she should have the potential to control project team development or more of the above systems

- ★ Excellent work environment
- ★ Paid overtime
- ★ Flexi hours, 4 weeks' holidays
- ★ Company expansion with additional hardware
- ★ Distributed processing
- ★ Salary £6,800

REF 1827

## PROJECT LEADERS

An outstanding opportunity exists within international finance group for 2 project leaders with experience at that level on ANY hardware preferably in financial or insurance areas. Ideal candidate will have dynamic personality, confidence and self-motivation, be able to liaise at all levels and responsibility to act on own decisions

- ★ Security in a growing organisation
- ★ Mortgage assistance/STLS/Non-contributory pension
- ★ 6 weeks' holiday/club restaurant
- ★ OPPORTUNITY TO TRAVEL ABROAD
- ★ Salary £7,000

REF 1848

## SALES PERSONS

Major world-wide organisation seeks enthusiastic self-motivated persons with proven record in sales, previous experience with computer or business machine manufacture an advantage. Successful applicant will be selling variety of hardware or related software to industry, commerce and local authorities

- ★ Excellent career prospects
- ★ Attractive fringe benefits
- ★ Salary Expected earning £16,000

REF 1838

## PROGRAMMERS

Prestige world-wide manufacturing company located in Amsterdam seeks programmers with minimum 2 years' COBOL & ASSEMBLER and PL/I & ASSEMBLER exp. to become involved in the development of sophisticated airline communication systems

- ★ Excellent prospects for career path
- ★ Varied work of a highly interesting nature
- ★ First-class perks including RELOCATION expenses
- ★ Salary range £11,000-£13,000 neg.

REF 1853

## MINI PROGRAMMERS

Prestige company operating on a global scale are recruiting persons with 1-3 years' exp on ANY MINI ASSEMBLER to work in their new mailroom offices. Having large DEC POP II equipment and expanding at a rapid rate they have a wide range of on-going projects both in hardware and software areas

- ★ Extensive training in up-to-date technology
- ★ Excellent career opportunities
- ★ Training in RSXII, RT11 and RSTS
- ★ Opportunity for future travel
- ★ Salary £8,500 c

REF 1478

## ANALYST PROGRAMMER

Our client a major preservation society based in rural Wiltshire have vacancies for analyst-programmers with at least 18 months' RPLII experience. They are involved at present in taking over all major systems from their head office and have their development work planned for the next five years. Co offers

- ★ Variety of exciting new development work
- ★ BEAUTIFUL rural surroundings with very reasonable house prices
- ★ Generous RELOCATION assistance
- ★ Salary £5,000

REF 1637

## PROGRAMMERS

Management services division of major British group with annual turnover of almost £1,000m seeks COBOL programmer with minimum 2 years' IBM or ICL COBOL. Within a project team programmers will become involved in program design, coding, testing, documentation and maintenance as well as assistance in systems implementation

- ★ Comprehensive range of applications
- ★ Opportunity to move to more advanced technical projects and a variety of languages and machines
- ★ Paid overtime - flexi hours - sub restaurant amongst many of the excellent perks
- ★ Relocation expenses
- ★ Salary to £5,500

REF 1824

## JUNIOR PROGRAMMERS

Multi-national company retaining large IBM 370 hardware requires programmers with at least 12 months' ASSEMBLER experience to join highly professional team. They are currently developing a major sophisticated on-line system

- ★ Highly progressive organisation
- ★ Continued development with a well-planned schedule
- ★ Good promotional prospects
- ★ Excellent benefits including cheap travel
- ★ Salary to £8,000

REF 1280

## ANALYST PROGRAMMERS

One of the country's leading retail organisations seeks analyst-programmers to work at local level on the development of new interactive and distributed systems. Currently retain Burroughs B370/4700 hardware and are also investing in RPLII equipment. They seek persons with 2-3 years' exp in design analysis and/or programming (ANY LANGUAGE) to make a career with them

- ★ Unusual opportunity to learn new language and get on to MINI computers
- ★ Significant rise in contract
- ★ RELOCATION expenses
- ★ Salary to £6,150

REF 1655

## ANALYST PROGRAMMER

Electronics manufacturing co working on a scale seeks clear, logical thinking analyst-programmer for their ICL 1900 series equipment

- ★ Control of small development or support projects
- ★ Supervisory exp
- ★ Full scale of projects ranging from packages to financial modelling
- ★ Subsidised restaurant/drink club
- ★ Salary £5,500

REF 1131

## PROGRAMMERS

A major organisation in the retail trade is pursuing further interests in a rapid and expanding NCI Century equipment with Crivener VB 680 scheduled for delivery at the end of the year. They seek programmers with 3 years' COBOL exp on any machine for their main control system utilising TOTAL database

- ★ Plenty of new development work
- ★ Training in Ontabase
- ★ Sports and social club in beautiful, peaceful outdoor pool, squash courts, etc
- ★ Excellent perks - LVs, discounts on goods
- ★ Salary to £11,250

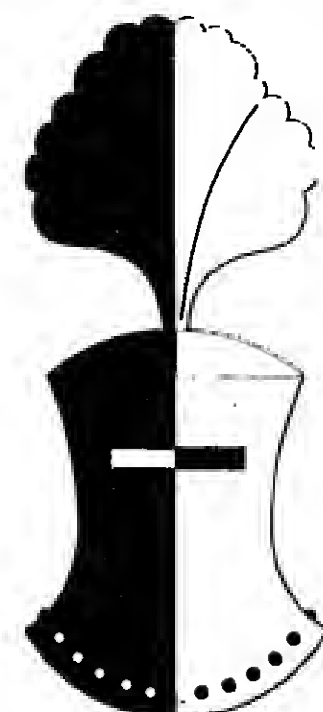
REF 1812

## SYSTEMS ENGINEER

World-wide manufacturing company with office in Frankfurt seeks engineer for sophisticated communication systems. Ideal applicant should have in-depth experience of communication systems switching on any MINI. Good knowledge of GERMAN is essential. Co offers

- ★ Relocation expenses
- ★ Good career prospects with excellent growth potential
- ★ Generous fringe benefits
- ★ Salary to £15,000

REF 1578



## CONTRACT MIDLANDS & N. ENGLAND

PROG IBM COBOL DL/I  
SNR PROG IBM CICS ASSEM  
DATABASE DESIGNERS ENGINEERING  
SYSTEMS ANALYSTS FINANCIAL  
PROG IBM PL/1 CICS  
PROG HONEYWELL 66 IDS/TDS COBOL  
PROG ICL 2960/2970 VMEB/K  
PROG UNIVAC 1108 COBOL  
SYSTEMS ANALYST IMS DB/DC

MIDLANDS  
NORTH WEST  
NORTH WEST  
SCOTLAND  
MIDLANDS  
NORTH WEST  
YORKS  
NORTH WEST & MIDLANDS  
NORTH WEST

FOR DETAILS OF THESE AND OTHER CONTRACTS, PLEASE CONTACT MR. PERRY BUTLER, 143/144 ROYAL EXCHANGE BUILDINGS, CROSS ST., MANCHESTER, M2. TELEPHONE NO. 061-833 9341/3.

## KNIGHT PROGRAMMING SUPPORT LIMITED

520 ROYAL EXCHANGE, MANCHESTER M2  
OFFICES: AMSTERDAM, PARIS, BRUSSELS, LONDON, BIRMINGHAM



## AUSTRALIA

Management Application Systems P/L, a software consulting company, is urgently seeking experienced EOP personnel on behalf of ourselves and a number of clients in various industries. The positions are in Sydney and Melbourne and some are offering paid air fares to Australia for successful applicants who are able to relocate at an early date.

## 6 PROGRAMMERS

A large company using an IBM 370/145 under OS requires competent programmers on 12 and 24 months contract basis with opportunity for continual employment available after contract period.

Qualifications:

- At least 3 years' programming experience
- At least 2 years' IBM OS COBOL programming experience
- Recognised diploma or degree in computing
- Applicants will desirably have experience in any of the following:
  - programming experience in another language - ASSEMBLER, PLI, FORTRAN, TABS/TAB 380
  - experience with interactive timesharing - TSO
  - Database applications - IMS
  - Prior experience in ICL 1904A GEORGE 2 or 2+

Remuneration - return air fare UK-Melbourne  
- Initial accommodation  
- 4 weeks' annual leave  
- salary - minimum \$13,000 depending on experience  
- nine day (70 HR.) fortnight.

Applications will be considered only from people who definitely intend to go to Australia.

The above (and other positions) offer participation in challenging and interesting projects under pleasant working conditions. The successful applicants will be given all possible assistance in relocating and settling in Australia.

We will be interviewing applicants in London from 8/8/78. Written applications with detailed resume (and telephone no. for personal contact) should be submitted to: R. M. Blythe, c/o M. Bertherton, Hoskyns Ltd., 145 St. John's Street, London, EC1.

## CAREER OPPORTUNITY IN

## IRAN

A major Iranian computer service bureau needs the following Data Processing Professionals to meet the demands of a rapidly expanding business.

## SYSTEMS PROGRAMMER

Minimum 5 years' experience. Knowledge of 370 Assembler, COBOL, OOS/POWER/VS. CICS essential. Experience in data base design and computer systems measurement + performance enhancement would be advantageous.

## SOFTWARE DEVELOPMENT

Design and development of new products. Knowledge of 370 Assembler COBOL and OOS/VS plus 5 years' experience.

## SYSTEMS ANALYST

At least 5 years' experience including successful implementation of at least one major project. Familiarity with on-line applications and data base management would be advantageous in satisfying the position objectives.

Applicants for all the above positions should possess a University degree. Interviews will take place mid-August in London. All applications will be acknowledged.

Please submit resume in strict confidence including salary history to

CMS IRAN-HAMBURG CO. LTD.  
Steintorweg 4-6  
Hamburg 7, West Germany

## SHEFFIELD CITY POLYTECHNIC DEPARTMENT OF COMPUTER STUDIES SENIOR LECTURER IN INFORMATION SYSTEMS

Salary Scale £5085-£7085 (per)

- £7572

Applications are invited from well qualified candidates in each aspect of data processing to undergraduate courses in computing as well as courses in business studies. Ideally candidates will have industrial experience as well as a particular expertise in the data processing area. The successful applicant will be responsible to assist the departmental training tutor in the placement of students in industry and an interest in the activity is therefore essential.

Request for an application form in writing only, please, to the Recruitment Section of the Personnel Department, Sheffield City Polytechnic (Dept. COV), Hall Road, Sheffield, S1 2NS. Completed forms should be received by 31st August.

## OPERATIONS MANAGER

ORPINGTON, KENT UP TO £5,500 p.a.

The Harris/Queensway Group is a rapidly expanding carpet and furniture retail organisation with branches throughout the U.K. We have installed a Hewlett-Packard 3000 computer (102K bytes processor, disks, tapes etc) at our new head office in Orpington. This supports a variety of commercial work with extensive use of on-line terminals.

We urgently require a manager to be responsible for all the operations function. Applicants must have at least two years' experience of computer operating and preferably some supervising experience. Experience on any computer with a sophisticated operating system is relevant. The job will be particularly attractive to someone who is a fast learner and who is happy to work on a variety of tasks with little supervision, in a small installation.

No shift work is necessary and working conditions are excellent.

Please telephone or write to:-  
Roger Lawson  
Group Data Processing Manager  
Harris Carpets Limited  
Harris House, 79 High Street  
Orpington, Kent  
Telephone Orpington 38877



## Data Processing Department

Buxley will start in-house data processing from August, 1978. The equipment will consist of a 1 megabyte IBM 370/138 under OOS/VS with CICS, PL/1, COBOL and FORTRAN. An extensive VOU communications network is also planned. Data entry will be by REDIFON R300. A two shift system will operate.

## SENIOR OPERATOR

GRADE AP3: £4,017-£4,431 including London weighting and supplement + shift allowance of 14% of basic salary and £105 per annum. Successful applicant should have at least two years' operating experience, especially on IBM Mainframes using OOS/VS. A knowledge of JCL would be of considerable advantage.

## OPERATOR

GRADE AP2: £3,854-£3,936 including London weighting and supplement + shift allowance of 14% of basic salary and £105 per annum. Applications are invited from existing IBM operators with at least one year's relevant experience.

Please write on telephone for an application form to: D. Jervis, Operations Manager, Data Processing Department, 9 Buxton Road, Buxley Heath, Kent; 01-303 7777 Ext. 762. Closing date: 18th August, 1978.

## Bexley London Borough

## Senior Computer Operator

Salary £3278-£4148 (including supplements), required in Borough Treasurer's Department for ICL 2904. Consideration will be given to provision of housing accommodation and payment of removal and legal expenses. Starting salary will be dependent on age, experience and qualifications, etc. Application form from Borough Treasurer, P.O. Box 4, Town Hall, Gosport, Hampshire (or telephone Gosport (07017) 84242, ext. 102). Gosport Borough Council

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## CONTRACT DIVISION

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BELGIUM  
IRAN  
PARIS  
BELGIUM  
GERMANY

ANALYST PROG IMS COBOL  
IMS COBOL PROGS  
POP RSXII FORTRAN  
POP RSXII MACRO II  
SNR ANALYST DATABASE DESIGN  
BURROUGHS 6700 COBOL  
DL/I COBOL PROGRAMMER  
POP MUMPS/BASIC OR ASSEMBLER  
ICL GII COBOL  
POP RSTS BASIC +  
ANALYST PROGRAMMER/IMS  
1900 COBOL GII

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£230 p.w.  
£230 p.w.  
£180 p.w.

## KNIGHT PROGRAMMING SUPPORT LIMITED

27 NOEL STREET, LONDON W1. TELEPHONE 01-734 0152/6 (24 HOURS)  
OFFICES: AMSTERDAM, PARIS, MANCHESTER, BIRMINGHAM







Data Processing Recruitment Consultants

## U.S. Banking Corporation City of London

Salaries: £6.5-8K + Mortgage

A major U.S. Banking Corporation with extensive computer facilities in the City requires additional D.P. personnel up to team leader level for both their Mini and Mainframe divisions. The Mini Division in particular requires COBOL programmers and Project Leaders possibly with a financial background. The Mainframe Division is in need of PL/I programmers with possibly COBOL or BAL as a second language. Whilst the IBM 370 operating system is O.S. our Client may consider competent DOS program-

mers. The ability to work as a member of a project team under strict documentation and programming standards is important. Mini programmers will have at least two years Real-time experience using COBOL and may also have experience of ASSEMBLER. In addition to above-market salaries the Bank offers a 2½% subsidised mortgage facility and personal loan scheme, private health and a non-contributory pension plan.

Ref: 18/A

## Message Switching + Communications London or Home Counties

Salaries: £6.5-11K

A prestige International Client is seeking to expand and establish new project teams working on wide and varied applications areas with emphasis on Data Communications, Message Switching and Mini Software. Can you picture yourself working in the forefront of mini systems applications and software development? Become a member of one of numerous specialist project teams in which you will make a valuable contribution whilst at the same time expanding your own frontiers of knowledge and experience. This is a unique opportunity to enhance your career by extending your horizons and developing State-of-the-Art D.P. technology.

Successful candidates are likely to be either graduates (Computer Science or Maths) or have a very solid background in advanced computer applications and are probably aged between 23 and 33. You are presently likely to be either a Systems Designer/Consultant, Analyst Programmer or a programmer in a Mini computer environment with extensive Assembler experience. Any specialist expertise in the areas of Data Communications, Message Switching, computer networks, Process-control or Mini computer software will be considered particularly advantageous.

Ref: 18/B

## Systems Designers + Programmers etc. Cheshire

Salaries: £6-9.5K (a.a.e.)

A very prestige client with headquarters in London and regional offices located in Cheshire and throughout Europe, urgently requires the following: Real-Time and on-line Programmers, System and Data base designers and compiler specialists with 2/5 years experience. Of particular interest would be people with relevant experience in one or more of the following: Ferranti DEC with Basic, RTL II or Corel and IBM

or ICL with Assembler, PL/I or COBOL. Also IMS or similar and Data Base design. The scope of projects is both broad and demanding and certainly in keeping with the prestige of this client. You will play an important role in project development and the opportunity to enhance your technical expertise is one of the attributes of working with this reputable group. Fringe benefits are well above average and full relocation expenses will of course be met.

Ref: 18/C

## Real-Time Software E.E.C.

Salaries: £10-16.5K + Outstanding Benefits

When it comes to State-of-the-Art Real-Time Mini Software our client defers to no one. They are internationally regarded as technical frontiers pushers and as valued project team members you will share their prestige and acclaim. To meet a continued phased growth programme our client is establishing several new project teams requiring Consultants, Project Leaders, Analysts and Programmers. The letter will be well versed in

Assembler and the former will either be graduates or have extensive relevant experience in Real-Time software. Willingness to relocate for a meaningfully extended period to one of the most desirable E.E.C. locations is important. Every assistance will be given to candidates and their families in relocation. Interviews will be held in London early in August and offers made within 7 days.

Ref: 18/D

## RSX-11 Programmers E.E.C. + London

Salaries: Europe c. £15K + U.K. to 9K

Our clients, pioneers in frontier communications developments have contributed significantly to the accelerated advancements in Real-Time Mini Computer technology and are internationally recognised as market leaders in their field. In pursuit of maintaining their forefront leadership our clients seek to identify key personnel to join them in their next development phase. Real-time specialists with strong Mini Computer backgrounds experienced in the implementation of RSX-11 will make a vital contribution to the attainment of these goals within an environment offering the highest standards of professionalism.

Successful candidates will ideally be graduates (computer science or related discipline) or will offer exceptional relevant experience in Real-Time software development. Applicants are likely to be currently engaged in Data Communications or Real-time systems and software development within either a mini implementation or sophisticated applications environment. Interviews will be held in London early in August and offers will be made to successful candidates within 7 days.

Ref: 18/E

Logistix, Freepost 32, London W1E 3YZ  
01 491 4636 Telex 28800  
(Reverse charges)



Avon House, 356 Oxford Street, London W1N 9HA

## Software for Avionics Systems CHELTENHAM

The Aviation Division of Smiths Industries has a heavy commitment in programmed avionics equipment now essential to the operation of modern high-speed aircraft, both military and civil.

So we are rapidly expanding our software activity to develop a variety of applications employing the most advanced systems technology.

These positions will attract specialists at various levels up to senior, with several years' relevant practical experience and degree or equivalent in electronics, computer science, mathematics or other related subject. This includes newly-qualified graduates aiming for top-position experience.

You would work with small project teams, have computer access and considerable responsibility for your part of the software.

## Real-time Airborne Software

Here you would design and program airborne mini and micro-computers for cockpit display, weapons guidance and flight control. A high level of job satisfaction-through direct contribution to aircraft performance and customer liaison-is assured.

## Support Software

backs the equipment activity with the design production, adaptation and maintenance of compilers, assemblers, interpreters and design/analysis/documentation tools for airborne computer programming-including the support of a growing range of micro-processors.

We offer attractive starting salaries, plus the full range of benefits customary in a major international organisation-including relocation assistance to this pleasing area of the Cotswolds. If you are seeking advancement in a growth activity write to:

H. Upson, Assistant Personnel Manager,

SMITHS INDUSTRIES LIMITED



AVIATION DIVISION

Bishops Cleeve, Cheltenham, Glos. GL52 4SF.

Computer Data  
Processing  
Limited

## EXPERIENCED OPERATIONS STAFF

Salary £4,400 p.a. (inc. shift allowance)

Due to further expansion, experienced operators and control clerks are required to join our efficient and hard-working Operations Team.

The configuration consists of two large ICL System 4/72s plus VDU's and RJEs.

Ideally, applicants should have two years' experience on either System 4 or IBM 380/370 machines and a good knowledge of JCL.

Three-shift working is in operation in both the Computer Room and Control Department.

A 3½-hour week is worked plus four weeks' holiday after one year's service.

Our office is located very close to the main-line station (London 43 minutes and Brighton 15 minutes).

Applications to  
Alan Marron  
Operations Manager  
Computer Data  
Processing Ltd.  
Oakfield House  
Parrymount Road  
Haywards Heath  
Sussex  
Telephone:  
Haywards Heath  
58188

ipc

## PROGRAMMER

Required to join a small data processing department, currently operating on ICL 1901A Olac System. This system is scheduled for replacement shortly, and this is an ideal opportunity for the right applicant to gain development and installation experience.

Suitable applicants must have a minimum of between six months-one year Cobol experience and a knowledge of ICL Systems would be advantageous.

This is a progressive position offering an attractive salary, five weeks' annual holiday, contributory pension scheme, canteen facilities. Opportunities of advancement within the O.K.N. Group.

Written applications giving all relevant details to:  
The Chief Accountant  
The Firth Company Limited  
Wire Manufacturers  
Nora Street, Warrington WA1 2JH  
Tel. 0925 38881

GKN-Britain's largest  
international  
engineering group

## BOROUGH OF SOUTH TYNESIDE DIRECTORATE OF FINANCE PROGRAMMER £3275 - £5073 inclusive

A COBOL Programmer is required, preferably with experience of GEORGE 2 to work in an ICL 1902A installation with input via Redifon Seachack.

The configuration is under review and a major upgrade is planned for the near future.

Application forms are available from the Chief Personnel and Management Services Officer (Ref: 64), Westhose Hall, Westhose Village, South Shields, Tyne and Wear (Tel: South Shields 552191) and must be returned by noon, 11th August, 1978.

Please quote the appropriate  
SYN number.

Central Electricity Generating Board - North Eastern Region

## SYSTEMS ANALYSTS PROGRAMMERS

HARROGATE

The North Eastern Region of the C.E.G.S. is responsible for the generation and main transmission of electricity to the eastern part of the country from the Scottish border to south of the Humber.

The Computer Branch is responsible for computing development and production work on an ICL 1904S computer, and bears functional responsibility for Regional work on the twin IBM 370/68 installation in London, and for computing developments utilizing mini computers elsewhere in the Region. It is intended within the next 18 months to replace the existing ICL 1904S/192K store.

EOS 60's, MT's etc., operating under George II) by a current generation system with the capability of supporting a comprehensive communications network. It is expected that there will be a growth of distribution computing at larger Power Stations. As part of the planned development of management systems in the Region additional computing staff are required. The proposed applications include Metering Control/Purchasing, Control and Scheduling, Work control and scheduling, Plant performance analysis, other engineering systems, maintenance and support of Production work.

Applications are invited for the following posts:

### SYSTEMS ANALYSTS

Applicants for these posts should have a degree or professional qualification and substantial experience of analysis and design. The salary will be within one of the following ranges:

£4650 to £6150 p.a. SYN 64/2/CW  
or £5450 to £7450 p.a. SYN 64/2/CW

### PROGRAMMERS

Applicants with a degree or professional qualification will be preferred with at least one year's programming experience using Cobol on a Fortran or an ICL 1900 computer operating under George II.

Persons with less experience or who wish to train as a programmer may be considered for appointment as Trainee Programmer.



Please quote the appropriate  
SYN number.

Central Electricity Generating Board - North Eastern Region

# Upgrade to 2970

## and increase your professionalism in operations or support.

Our client is a dedicated team of computer specialists in West London, linked to a multi-national computer organisation, offering a bureau service using

1904S • 1904A • 1902T • 2970 • G2/3 • Communications • MAXIMOP • IDMS  
They offer the opportunity to gain valuable experience in this mixed environment to -

### Operators and Team Leaders

You must be energetic, ambitious and capable with experience relevant to the above - at least 9 months for Operators; 2/3 years for Team Leaders - prepared for hard work and able to work under pressure. Salaries are between £3,500 and £4,200 inclusive of allowance for Operators; up to £4,700 for Team Leaders.

### 2970 System Support

Essential experience is VME/B with particular emphasis on TP IDMS and COMMS. This is an opportunity to be involved on the ground floor of this project; this implies a preparedness and determination to make the installation of the service successful. Salaries are between £4,500 and £6,500.

In addition to the above a bonus scheme is in operation, with a remuneration review in September.

There are real prospects of development and promotion for all levels of staff both inside the Operations/Support departments and outside with Sales/Support/Applications departments.

MOXON  
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& KERBY  
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MANAGEMENT SOLUTION

There is lots more to tell you about this exciting offer, so come along to meet us and have a drink and a chat.

If you can't make it telephone Jeff Parmenter on 01-536 1500 during normal office hours to make alternative arrangements.

Monday 31st July  
Richmond Hill Hotel,  
Richmond Hill,  
Surrey.

Informal Interviews  
8.00 AM - 8.00 PM.

Tuesday 1st August  
Heathrow Hotel,  
Bath Road,  
Hounslow.

## HARDYS (66/05) COMPUTER OPERATIONS RULE O.K!

We are a small select band of happy Idiots who are finding life a bit lonely. If you are slightly or totally committed to insanity, you should give some proof that the HONEYWELL GCOS operating system is not completely alien to you. Alternatively, if you fancy joining us anyway, we could do with anyone who has been bewildered by a computer for about 6 months. The pay isn't bad: £3,700 inc. for a senior operator and £3,200 for an operator; it's only 2 shift workings; there is some overtime for the more responsible element who may join us; we get 30p per day L.V.s and discount on various goods.

So if you feel we are the sort of people you are looking for, write, or if you prefer, telephone, giving a short résumé of career to date to:

Mrs. J. Ford, Personnel Manager  
Hardy House, 112-114 High Street, CROYDON, Surrey  
Tel: 01-886 4422 (Ext. 288)

## SENIOR SYSTEMS ANALYST

(£5,970-£7,500 p.a.)

To supervise a specialist team developing T/P and batch systems in support of radio broadcasting. We have two ICL 2980s operating under VME/B and experience of this range is preferred.

Applicants should have several years' experience of managing a project team, and have the ability to communicate effectively with others who may be familiar with computer technology. Knowledge of Database management systems is desirable. Based in Central London.

Please telephone or write immediately, enclosing addressed envelope for application form quoting reference 78 G 1485 CV, to Appointments Department, BBC, London W1A 1AA. Tel: 01-580 4488 Ext. 4816.

BBC



## COMPUTER OPERATOR

£3650 including shift allowance

General Foods is a multi-national company and one of the country's leading food manufacturers with a U.K. base in Banbury, Oxfordshire. Our products - Maxwell House Coffee and the Bird's range of desserts, are household names.

We are looking for an Operator to join our team, working a 3 shift rota.

You should ideally have a minimum of 6 - 12 months experience on IBM 360 or 370 systems, but experience on other systems will be considered. Training will be given. The operating environment on our 370/135 includes DOS/VS, POWER/VS, CICS/VS, 3340/44 disks and local VDU's and tapes.

Promotion prospects and fringe benefits are good. Generous re-location expenses will be paid.

Please write or telephone for application form to:

Richard Wills,  
Assistant Employment Manager,



General Foods Limited,  
Banbury,  
Oxon OX16 7QU  
Tel: Banbury 4433 ext 405

## The AEW Nimrod real-time system. The most challenging systems project you could ever work on.

There's nothing in the world like the real-time data processing system that's the heart of the Airborne Early Warning Nimrod. That's fact, not opinion. The system handles all the data from one of the world's most advanced radars, from the aircraft's communication equipment and instruments, and from other sensors. It operates within the strictest definition of real-time, and to the highest standards of software integrity.

If you're becoming increasingly frustrated with designing and implementing systems that all seem to have much the same applications, come and work on the functional specifications for the AEW Nimrod software and its associated proving facilities.

You'll be more familiar with the work than you might imagine - especially if you have a sound background in real-time systems and analysis.

But the one thing you won't be familiar with is the interest and satisfaction of becoming totally involved on a major system with a totally new application.

And on that score, few jobs can compete with these:

**Mission Software Section Leader**

To lead a section responsible for producing the software to run in the central computer of the AEW Nimrod. This task will involve interpreting

the customer's operational and technical requirements and will necessitate liaison with the hardware system and design teams.

**Software Proving Facility Section Leader**

To lead a section responsible for the software that will validate the real-time system. The facility will be based on a complex computer system in which both the scenario and the various systems which provide data to the AEW Software will be simulated.

**Real-time Executive Section Leader**

To lead a section responsible for writing the executive to control the real-time applications code. The responsibilities of this section may also include: carrying out studies on specific aspects of the customer's requirements, or on specific aspects of the design of the software; system assessment by means of mathematical modelling and off-line computer simulation.

These are all senior positions open only to men and women who have several years' relevant experience. Posts are also available in each of the sections for those with less experience and for those employed in related fields, who wish to broaden their experience.

Ring me, Richard Wilson, now on 01-953 2030 extension 3525. Or write giving brief details of your experience to Mr. H. E. Bitchelder, Marconi Avionics Limited, Elstree Way, Borehamwood, Herts. Please quote reference MA 78005.

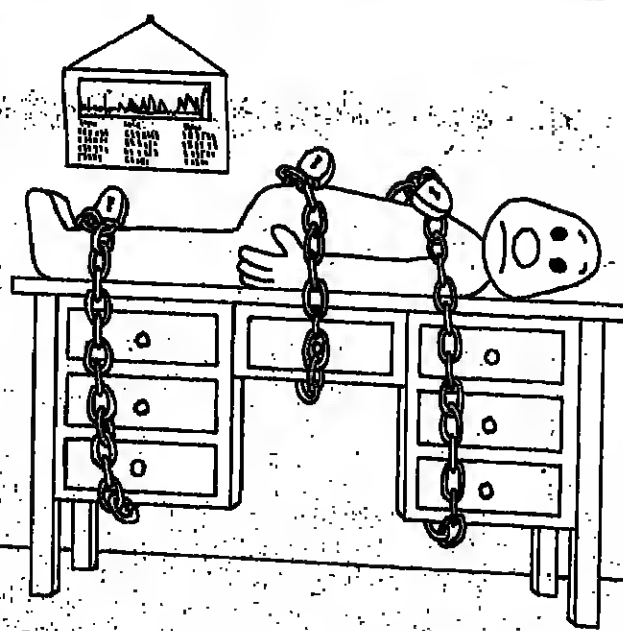
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## MYRIAD

### CHAINED TO A DESK ALL DAY? ... CONSIDER PROGRAMMING CONSULTANCY

3-4 years' COBOL

LONDON & HOME COUNTIES UP TO £6,500



We are seeking a Programmer or Analyst/Programmer keen to accelerate his/her career by a move to Trainee Leading. You will be expected to play a major role in the development of new systems, being responsible for the programming and implementation of projects from specification to overall testing.

The person appointed will have in-depth knowledge of COBOL with an appreciation of commercial data processing. Previous supervisory experience is not essential although a commitment to maintaining high standards of coding and documentation are required.

The Company, a Systems and Programming Consultancy, offers a professional environment with the exciting prospect of allowing your career and responsibility to grow with the Company.

Ref. W3/1307

MYRIAD APPOINTMENTS LIMITED Computer Personnel Consultants  
Telephone, or write to: 30 Fleet Street London EC4Y 1AA 01-353 0981 (24 hrs)

## Sales Manager

Minicomputer Products  
Southern England

c. £6,800 pa + bonus + car

Please Peripheral Systems Ltd. is a worldwide supplier of minicomputer add-on and peripheral products. Sustained growth of its UK operations necessitates the recruitment of a Sales Manager for the southern area. The role involves both CRM and B2B sales. The objectives will be to establish contact with existing customers and to identify new customers and new product opportunities. Applicants, male or female, should be able to demonstrate a successful record in sales. Experience of minicomputers and/or peripherals is particularly desirable. The successful candidate will receive a competitive salary and bonus potential up to 30% of salary, a company car, BUPA membership and other benefits. Please send your CV, with salary history, to: Sales Manager, Please Peripheral Systems Ltd., 100 Water Lane, Tower Hill, London E1 4JN or telephone the General Manager, Mr. M. J. 702015 (between 9.30 am and 5.30 pm) for an interview. (24 hrs)

**PLESSEY**

## ANGLIAN

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Don't fancy commuting to London?  
These are just some of the jobs we have available in East Anglia.

**Sen. Systems Analyst (ICL)**

S. Essex c. £8,000

**Systems Analyst (ICL)**

Suffolk c. £4,500

**Programmer Analyst RP02**

Suffolk £4,000+

**Programmer (IBM)**

C. Essex c. £4,000

**Programmer (ICL)**

Suffolk c. £3,500

Ring Karen Burden on Danbury 4255 1872 (024541) (lines open 24 hours), or write to: ANGLIAN D.P. SERVICES LTD., Stratford House, Nelson Road, Danbury, Chelmsford CM3 4QW.

## Cobol Programmers

£6,000 p.a. +

(Plus Overtime & Bonus)

Duncan Bransom Ltd., as part of their expanding data processing activities, are looking for two experienced Cobol programmers, one for their Potters Bar offices and one to work in West London.

The work, which could either be in the general commercial area or in production control, would suit someone with at least a year's useful experience programming in Cobol, preferably on IBM machines. The Company provides people with the opportunity of developing their professional careers with projects involving IMS, MVS and the new 303x series.

Attractive fringe benefits include a profit sharing scheme and paid overtime.

The successful applicants will be required to maintain a very high standard of work at all times and to achieve a consistently rapid rate of output.

Please contact Roger Griffiths on Potters Bar 44681 to discuss a possible appointment, or write sending brief details of your career to date. Under no circumstances will your present employer be approached without first obtaining your permission in writing.

**Duncan Bransom Limited**

Potters Bar Office  
Hovis House, Mutton Lane,  
POTTERS BAR,  
Hartfordshire,  
Telephone Potters Bar 44681

Head Office  
37 Hillcrest Road,  
LOUGHTON,  
Essex,  
Telephone 01-608 5121

If you do not see a position below to suit you,  
telephone us anyway and we will find one for you ...

<b>PROJECT LEADER</b>	South Middx.	to £8000
<b>ANALYSTS</b>	South Middx.	to £6500
<b>SYSTEM S.DPS. SUPERVISOR</b>	Middlesex	to £8000
<b>ICL SOFTWARE</b>	North Surrey	to £6500
<b>SYSTEMS MANAGER</b>	Middlesex	c. £8850
<b>SOFTWARE PROGRAMMERS</b>	W. London/Middx.	to £7000
<b>ICL COBOL PROGRAMMER</b>	Middlesex	c. £4200
<b>SUPPORT ANALYSTS</b>	London & Midlands	£6K-£7½K + car
<b>PROJECT LEADERS</b>	East London/S. Essex	to £7500
<b>SYSTEMS ANALYSTS</b>	East London/S. Essex	c. £8700
<b>OPERATORS</b>	S. Middx. or W.I.	c. £4100

TELEPHONE: 01-859 8087

Peter Barton  
(Even. & Weekend 0702-521821)  
David Ward  
(Even. & Weekend 0298-36880)

Bernard, Davies & Ward Ltd.  
Computer Personnel Consultants  
107 Jermyn St., London, SW1

## Senior Systems Analyst

up to £7,000

## Senior Programmer

up to £6,500

## Programmers

up to £6,000

## Bracknell

Plus Fringe Benefits

We are a consumer finance and banking subsidiary of a major U.S. finance organisation. During the last three years we have grown to 80 branch offices and plan to continue this vigorous growth. We require staff with sound experience to establish a new branch terminal system. A full branch Terminal System Study based upon sophisticated processing techniques is currently in the early stages of development. The successful branch processing systems are processed on ICL 2903 equipment at a remote service bureau.



Applicants should write giving concise personal and career details to:  
A. Smith (Personnel Manager)  
HFC Trust Ltd., Cory House, The Elm  
Brookfield, Basingstoke.

هذا من الأفضل

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**SYSTEMS ANALYST** - London  
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Please send me an application form.

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Address

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Sound business knowledge is essential as the work not only involves the supervision of production and the quality control of the business systems being processed on our computers, but also involves detailed liaison with our clients on the use and extension of computer systems within their organisations. All applicants must have practical experience of computer systems and a sound understanding of accounting principles.

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These posts offer a wide variety of assignments and excellent career development. If you feel that you match up to our demanding and highly rewarding standards, please write or telephone for an application form, quoting ref. C/A to:

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London - Birmingham - Manchester - Newcastle  
Candidates should ideally have experience of working on 1900 equipment but other minicomputer experience would also be considered.

A competitive salary is offered commensurate with experience, plus a bonus scheme, holiday and call-out payments, London allowance, company car.

## ELECTRONICS ENGINEER CHERTSEY

Operating as part of a N.C. level with experience in fault finding and repair of digital electronic systems.

The person appointed will be responsible for the repair of circuit boards and allied peripherals and have the ability to specify and develop special purpose test gear.

Salary will be commensurate with experience, plus profit sharing scheme. Interviews will be held locally.  
Please write or telephone for an application form to:  
Mrs. Lynda Wood  
Mills Associates Limited  
Winstanley Road  
Monmouth, Gwent NP8 4YE  
Tel. Monmouth 2131

Mills Associates Ltd.

Computer Services



## SALOP COUNTY COUNCIL

SENIOR  
SYSTEMS  
PROGRAMMER

£6,060-£6,702

The job is to head a small team which will evaluate, develop, implement and maintain all systems software for IBM 370/138 installations with a growing network of remote terminals under VM and DOS/VS.

The installation has an extensive range of applications in operations and a forward programme of work, including the development of a comprehensive on-line interactive information system, has recently been approved by the county council.

LOCATION: Shrewsbury, Shropshire.

Further details and application forms from The County Treasurer, Salop County Council, Shire Hall, Shrewsbury, Salop SY2 6ND, or telephone Mr. G. Matthews on 0743 2222 35.

Application forms to be returned by 11th August, 1978.

South Eastern  
Health Board

KILKENNY, IRELAND

SENIOR  
PROGRAMMER  
(GRADE V)

The Health Board's data processing is based on an I.C.L. 2803 computer located in Kilkenny City.

The primary responsibilities of the job will be the supervision of the Board's programming activities and the maintenance and care of manufacturer supplied software.

The minimum requirements for the job are:

1. At least two years' experience in processing in COBOL using D.A.
2. Experience of the application of manufacturer's software.

Knowledge of structured programming techniques is highly desirable.

The post which is permanent and pensionable carries a salary scale of £5,180-£6,878.

Closing date for completed applications is Monday, 21st August, 1978.

Application forms and particulars may be obtained from:

Personnel Officer  
South Eastern Health Board  
Anita Maize  
Black Street  
Kilkenny

The Centre operates using IBM 360/50 with MFT II and HASP, also a system of linked CDC 6600s. We provide a computing service for research projects within the University.

Applicants are invited for the following position:

## COMPUTER OPERATOR

Minimum of 1 year's experience on a high IBM system is required. Starting salary, according to qualifications, experience, etc., £1,300.

Full time position, Monday-Friday 9.00am-5.00pm. Over 5 weeks annual holiday.

Please write giving details to: Yvonne Clark, Assistant Operations Supervisor, Computer Centre, University of London, 17-18, Gordon Street, London, WC1H 8AH, or telephone 01-857 0805.

CALCOMP  
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An experienced Calcomp (or similar) operator is required to operate our CALCOMP 745 Plotter and 1061 Plotter.

An excellent salary will be offered. Modern offices and friendly atmosphere. Opportunities for progression into Data Processing.

Forward resume to:

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LONDON BOROUGH  
OF BRENT  
SYSTEMS  
ANALYSTS

Two Local Authorities can offer their opportunities in Computer Development.

The London Borough of Brent seeks to appoint a Systems Analyst, with responsibility for identifying further opportunities for Computer Usage within the Borough of Development, and for identifying existing problems and recommending solutions.

Successful candidates must be female, who will hold the position of Computer Development Officer, will have full professional membership of the Institution of Engineers, Technicians and Technicians, and will be a resident of Brent.

Salary: £3,400-£4,000 (inclusive of all allowances).

A programmer is required to join a team responsible for the provision of a statistical and computing service to research workers and administrators. The post involves programming in FORTRAN on IBM 370 computers and also assistance with survey analysis using SPSS. Current projects include the maintenance of indices of educational priority.

Applicants should have experience of FORTRAN programming and a good knowledge of statistical methods. It is desirable that the applicant should have a degree in a relevant subject.

Details and application forms from the Education Officer, (ED/Stat 2A/1), Room 367, The County Hall, London SE1 7PS.

Forms to be returned by Monday, 14 August 1978.

For further information, please contact Mr. J. Barker, Tel: 0744 24061, Ext. 2305.

Written applications should be forwarded to the Personnel Officer, The County Hall, London SE1 7PS, by 7th August, 1978.

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bare essentials

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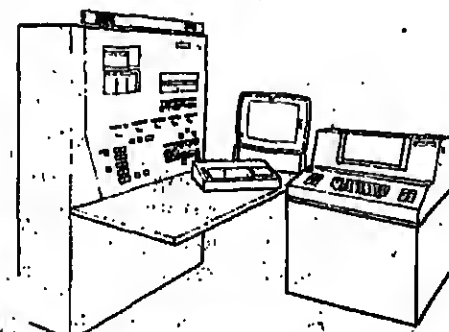
In ten years SDI has grown from a good idea to a solidly based growth orientated group with many hundreds of employees worldwide. We need real talent to maintain the pace—and we need it now.

If you have at least two years' experience of IBM Assembler and you're ready to play your part in developing system software on our IBM 370, then we can provide the kind of challenge you can get your teeth into.

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"Computer Sciences is probably the most diverse of all the service companies. CSC does systems development work, software, facilities management, time-sharing and a broad range of computer services. Its professional staff, numbering 6,000, is believed to be the second largest in the computer industry—second only to IBM's."

Our two principal UK software divisions are Network Applications and Defence Systems for which current opportunities are as follows:

**CSC** Computer Sciences Company Ltd.

## Network Applications Division

Language Designer £11,000-£14,000 (Ref. N6)

You will work with a small highly qualified team specifying comprehensive interactive language capabilities for commercial users. Your recommendations will be implemented across a family of European minicomputers. Minimum experience is 6-8 years including work on user languages and user computer interfaces. Location: Holland

Database Consultant £7,500-£9,500 (Ref. N7)

You will be responsible for analysing data-flow and data access requirements for a very large on-line database distributed over multiple locations with an interconnecting communications network. Your design recommendations will lead to criteria for the choice of appropriate hardware and software. Practical experience in database design is essential and experience of proprietary packages is desirable. Location: London

Commercial Analyst £6,000-£7,000 (Ref. N8)

You will assist in the design and development of an on-line minicomputer based system to be installed for commercial applications in multiple European locations for a major international manufacturing organisation. The minicomputer will be linked to IBM mainframes for background processing. Experience of on-line commercial applications essential. Location: London

Communications Analyst £6,000-£7,000 (Ref. N9)

Working on the same project as N8, you will be responsible for the effective utilisation of a minicomputer's systems software for on-line processing and for communications linking between computers. Hands-on experience of linking software is essential and a knowledge of query language processors desirable. Location: London

## Defence Systems Division

Command and Control Analyst/Designer £7,000-£8,500 (Ref. D10)

Command and Control Systems bring together the latest techniques in message handling, information retrieval, graphics, database design, minicomputers and mainframe systems software.

Computer Sciences is the leading systems company in this specialist area and we require additional analysts/designers to work in the UK and other NATO countries. Candidates should be experienced in establishing military operational requirements and have design experience in one or other of the above techniques. Location: London (with short-term continental assignments)

Honeywell Analyst/Programmer £5,000 to £7,000 (or continental equivalents) (Ref. D11)

We require analysts and programmers with experience of the Honeywell 6000 series or Honeywell Series 60 level 62 to work in the development of on-line systems for logistics and command and control applications. Location: London

Please contact Sarah Orm at:  
CSC UK Computer Sciences Company Ltd., Heathcoat House,  
20 Savile Row, London W1X 1AB. Tel: 01-437 3943.

MARKETING, SALES AND PROGRAMMING  
PROFESSIONALS

CalComp, the leading supplier of Computer Graphic Systems and Memory Peripherals is expanding its European Organisation to take full advantage of the potential in new and expanding market areas. In particular, new products—such as the important Interactive Graphic Systems (IGS)—are being introduced in the near future. Opportunities, therefore, exist to join the Company at an important stage of its International progress.

market in Europe. He/she will also assume responsibility for sales training and support to the European sales forces.

## SALES

SALES ENGINEER  
Middle East Area

Having greatly expanded our operations in the Middle East, we now seek to appoint a Senior Sales Engineer to take responsibility for sales in this area. Candidates should have a minimum of five years' experience in Computer Sales, preferably in the Graphics field. This position will involve extensive travel throughout the Middle East.

These are positions offering exceedingly attractive remuneration, commensurate with both high status of the professionals we seek and our own reputation.

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EUROPEAN PRODUCT SPECIALIST  
Interactive Graphic Systems.

This is a senior position for which we seek an experienced Computer Marketing Executive with specific knowledge of the Interactive Graphics field. The successful candidate should have a sound technical and marketing background, so as to be able to contribute significantly to the successful development and implementation of CalComp's strategy in securing a major part of the IGS

## PROGRAMMERS £4000-£7000

The European Software Group provides sophisticated programming support for CalComp Offices throughout Europe. Projects are based on a wide variety of Computers and cover our extensive product line which includes Pen, Electrostatic and Microfilm Plotters; Mini and Micro based Controllers; Interactive Graphic Systems; and Memory Products ranging from Floppy Disc Drives to 2400 Megabyte Sub-systems.

Our continued success and commitment to total software support creates vacancies for Programmers at several levels; specifically:

THE GRAPHIC PRODUCTS  
SUPPORT GROUP.

We require both Application and Systems Programmers to join our innovative Graphics Product Support Team. Candidates should be well versed in FORTRAN and/or an Assembler Language, and should have the flexibility to work in

a frequently changing systems environment.

THE MEMORY PRODUCTS  
SUPPORT GROUP.

Here we require Programmers to offer pre-sales, installation and post sales software support for CalComp's technologically advanced Memory Sub-Systems. This offers a challenging opportunity for Programmers with solid low-level language experience in a Disc Operating System environment.

The more senior positions will appeal particularly to self-motivated with good communicative ability. All positions will involve short excursions within Europe with the occasional visit to the United States.

If you are interested in any of these positions, please ring John Arnold on 0344 50211 or write to him giving brief details of your career to date to: CalComp Limited, Cory House, The Ring, Bracknell, Berks. RG12 1ER

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CALCOMP







AT LEAST £8,000 +  
COMPANY CAR

Our Client, an International Manufacturer of sophisticated disc-based Office Computers, has established a world-wide reputation for product quality and reliability, and fully understands that continuing success will be highly dependent upon the Company's ability to provide a range of effective standard application Software on an on-going basis.

It is intended to recruit one of the best qualified Specialists available in the UK and the salary level, into five figures for the right candidate, will not be a barrier.

The nature of this position entails total responsibility for the specification and production of commercial packages and will be a key appointment within the Organisation. The on-going career opportunity is totally commensurate with both the importance of this position and the abilities of the person who will be appointed.

Applicants must be able to demonstrate substantial and wide experience in the design of standard commercial applications for visible record and small disc-based business systems. This experience will certainly include at least five years with a Computer Manufacturer, ideally in an environment which has involved close liaison with Senior Sales and Marketing Management. Other benefits include Company Car, Pension, BUPA and relocation expenses where applicable.

Contact: MARGARET SYDES: 01-935 0871

Ref. CW/7/99

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**MANCHESTER** 061-833 0427  
Freepost, Blackfriars House, The Parsonage, Manchester M3 8BB  
**LONDON** 01-935 0471  
Freepost 4, 102, Blandford Street,  
London W1E 1JZ

Computing  
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Computer Personnel Consultants

### OIL IN CENTRAL LONDON?

Excellent opportunities exist for people keen to progress their careers within an expanding International Company providing a range of services to the oil industry in Europe, Africa, South America, the Middle East and Far East.

The central systems team is responsible for developing group systems distributed to overseas D.P. centres. Major development plans include the introduction of a Database on IBM 370 mainframes and a network of IBM System 34 computers throughout Europe.

### CHIEF PROGRAMMER

To £7500

The Chief Programmer will be responsible for project groups of programmers working on both 370 and System 34 projects. A good COBOL background is essential and a knowledge of Assembler and RPG II would be useful.

This position will be particularly attractive to those candidates able to demonstrate qualities of initiative and leadership who wish to advance their careers in a progressive environment.

### ANALYST/PROGRAMMER (COBOL)

To £7000

The Analyst/Programmer, reporting directly to the Projects Manager, will hold responsibility for systems pertaining to the Africa area of the group operation. Candidates should have a sound COBOL background, along with the ability to liaise with line management and produce results with a minimum of supervision. The position will be attractive to persons with proven analysis experience. OR programmers looking for an excellent opportunity to move into systems analysis. This position will require liaison with users in London and Paris; therefore candidates must be willing to undertake a limited amount of short duration travel.

### ANALYST/PROGRAMMERS (RPG II)

To £6500

Two outstanding Analyst/Programmers are required to assist in the development of a number of very interesting Systems 34 projects. Candidates must have a sound background in RPG II and an ability to communicate with users at the highest levels of management. A certain amount of travel to Scotland, Holland and Norway is envisaged. The company has exciting plans for future projects in this area and successful candidates will enjoy a most satisfactory career progression.

Besides genuine career prospects, the company offers a non-contributory pension scheme, season ticket loan, 12 and 4 weeks' holiday.

Ref. 81/2707

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30 Fleet Street London EC4A 3AA  
01-353 9981

## EMI Analyst/Programmer

At our Recording Designs Laboratories in Camberley we specialise in sophisticated electronic systems for underwater applications.

Due to continued expansion we are seeking to increase the size of our team of Analysts/Programmers. Applicants should ideally have real-time systems experience in a technical environment.

The successful candidate will be expected to design mini computer based software systems from either very broad customer requirements or from detailed mathematical specifications. He/she will then code, test and integrate the software with the applications hardware, at all times providing documentation to well defined standards. For individuals with the right motivation, a high degree of job satisfaction will be provided. The salary will be commensurate with experience and qualifications.

EMI Electronics Limited—Recording Designs Laboratories has an excellent working environment combined with a sound career structure and retains the flexibility of a small company working within a large Group. Promotion from within is the policy of the Company. Excellent Pension and Sick Leave Schemes are in operation. Four weeks annual holiday.

Write or telephone Camberley 26414 for an Application Form in the first instance to Jeani Cozens, Personnel Officer, EMI ELECTRONICS LIMITED—RECORDING DESIGNS LABORATORIES, Victoria Avenue, Camberley, Surrey.

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rdi

## SOFTWARE/HARDWARE ENGINEERS TELEPHONE SWITCHING SYSTEMS

Urgently required by STANDARD ELEKTRIK LORENZ AG, a leading West-German telecommunications company located in Stuttgart, capital city in attractive South-West Germany. You will be involved in the development of a new generation of processor controlled switching systems. Whether in hardware or software development you will participate in the entire process from analysis to implementation in close co-operation with energetic specialist teams.

If you possess experience in electronic switching development (software or hardware) or real time software design, plus reasonable knowledge of German (not required) we are eager to discuss this opportunity with you as soon as possible.

We are offering:

- a very attractive salary (up to DM 60,000 p.a.)
- a large range of fringe benefits
- assistance in integrating your family.

Find out further details by calling Mr. Biehme or Mr. Schewe from our personnel department under the number 01-2821234 (Hotel Cumberland) on Saturday, July 29th and Sunday, July 30th, from 9 a.m. to 5 p.m. or send a complete application to STANDARD ELEKTRIK LORENZ AG, Dept. CIS/PE, Attn: Mr. Schewe, BOB 400749, Germany, 7000 Stuttgart.

We are scheduling personnel interviews in London for shortly in the week thereafter.

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### UNIVERSITY OF SHEFFIELD TECHNICIAN (GRADE 3)

A vacancy has arisen for a Technician to assist with the computing requirements of the Physics Department. The post is for three years, from 1st October, 1978 and could suit a recently-qualified science graduate with appropriate experience. Salary on scale £2566-£3080 per annum. Please write to the Administrative Officer (Personnel) (Ref. 1102/1/77), The University, Sheffield S10 2TN.

## Chief Programmer

NW1 UP TO £8,000 p.a.

British Home Stores require a Chief Programmer for their Marylebone Road Head Office, to take control of a team of fifteen Application Programmers.

Apart from the day to day administration, other important aspects are to ensure that work is completed on time, and is technically sound, plus Recruitment and Training.

The successful applicant will also be expected to play a leading role in the implementation of improved programming techniques and interactive programme development.

The installation is a IBM 370/145, to which will shortly be added a 3031.

Ideally candidates will have at least five years programming experience in an IBM environment, using ASSEMBLER, COBOL and DL/1.

This position will attract people who wish to combine a future in application programming and management responsibilities.

Ref. CW 30/1

## Systems Analysts

Dublin £6,000-£7,000 p.a.

Our client, a major company in the construction industry, requires Systems Analysts for a new project team being set up.

Applicants should have extensive systems experience and be able to demonstrate at least one successful system personally implemented. Experience in teleprocessing would be a considerable advantage as the company will be implementing a TP system using new hardware.

Excellent conditions are offered in this installation, covering a wide range of commercial, financial and technical systems. Assistance with relocation will be given where applicable.

Write or telephone Gerald O'Leary in Dublin.

Ref. CW 30/4

## Maintenance Programmers

Central London c. £5,500 IBM/RPG II

One of our clients based in London, wish to recruit Programmers with IBM programming experience in COBOL and/or RPG II.

Working on a large variety of commercial applications from accounting to production control, they seek additional Programmers to support their current systems.

This is an opportunity for reasonably experienced Programmers to consolidate their programming to date and to build up their programming skills in an environment that does not demand specialist expertise.

Ref. CW 30/7

## Consultants

Reading £6-£8,000 p.a.

A major international Software House require Consultants who have experience on Mainframe and Minis for their Reading office. You will be responsible for —

• Advising clients upon their future computing requirements.

• Ensuring that clients choose the hardware best suited to their need.

• Assessing the practical problems involved in implementing advance Computer Systems.

• Working with clients to ensure that systems are installed successfully.

Therefore we are looking for experienced Systems Analysts who have the confidence to advance into consultancy work, and who can communicate effectively with senior management. You should also have experience in either General Accounting, Production Control or Distribution.

Ref. CW 30/2

## Programmers & Analysts

£4.5K - £8K

Consider the benefits of

- ★ Working in West London
- ★ Working on communications systems
- ★ Progression to project leadership
- ★ Variety of job contact
- ★ Programme development through VDU's

If you are a Programmer or an Analyst and have had exposure to commercial applications (on any hardware), our client would be very interested to learn more about you and discuss your future. They are a well-established software house and offer a career path based on real time earning above average salaries and large company benefits.

Projects are divided into small teams and there are many opportunities for men and women with management potential to gain experience in project leadership at a very early stage.

Ref. CW 30/5

## Systems Consultants

up to £7,500 + car

## Systems Engineers

up to £7,000 + car

North & West London - Manchester

Exciting opportunities have arisen in a highly successful American corporation specialising in communications and information handling systems for high level support systems.

Working in the nerve centre of a communications support team, successful candidates will be required to advise and trouble-shoot on our clients IBM Compatible Communications Hardware.

Excellent conditions of employment include travel in and out of the U.K., top relocation, expense and financial aid for successful candidates with a background in Data Entry Systems, high level languages and a knowledge of a European language.

Ref. CW 30/8

## Analyst/Programmers

to work on the implementation of computer systems

## Programmer

with good COBOL experience

## Senior Operator

responsible for day-to-day operation.

An IBM System 3 Model 12 is in operation using COBOL on disc. Salary will be commensurate with experience and will reflect the importance which the company attaches to a smooth running and efficient OP department. Assistance with relocation expenses will be given where applicable.

Write or telephone Gerald O'Leary in Dublin

Ref. CW 30/3

## Banking & Mini Computers

Programmers up to £5K

Consultants up to £9K

The banking division of a major U.K. Systems House is looking for staff to meet the needs of their clients. Particular requirements are:

- ★ People with experience of banking systems ranging from programmes with 12 months' experience through to consultants with 7 years' plus experience.
- ★ Mini Computer specialists with 1-5 years' experience to join a team working on the applications software for international distributed processing systems. Knowledge of OEC computers or RTL2.
- ★ Programmer and Senior Programmers with experience of RPG.

This is an exciting opportunity to join a group which is growing rapidly and where the development of your career depends only on your abilities.

Ref. CW 30/6

## Programmers & Analysts

up to £5,500 + car

NCR COBOL/NEAT 3 London

An exciting opportunity has developed for ambitious Programmers and Analysts to join a medium size, expanding computer company involved in automotive and finance industries.

Our clients computer operations are based on NCR Century 75, current plans include up-grading to a criterion: Development in progress in an interactive on-line communications system using audio response equipment on a nation-wide basis.

Programmers are currently required with one year's COBOL on the NCR 8000 series. Experience of IMOS would be advantageous, we also need Programmers with 18 months of NEAT 3 on Century machines.

Continual company growth based on development external customers systems guarantees excellent prospects for suitable employees.

Ref. CW 30/9

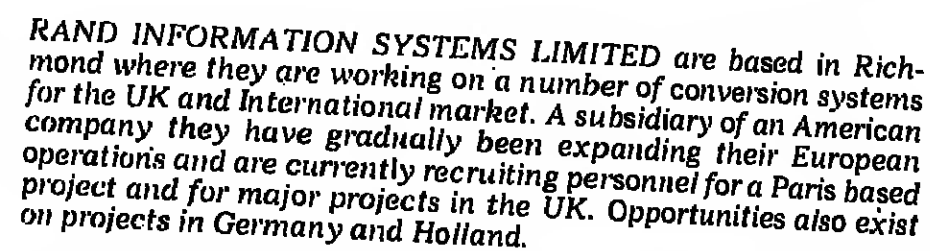
# Central Computing Consultants

KINGSTON: 44 Wood Street, Kingston upon Thames, Surrey, England. Telephone 01-549 3212 Telex 27950  
DUBLIN: Canberra House, 24 Lower Leeson Street, Dublin 2. Telephone 789577 (5 Lines)

Licensed annually by the Dept. of Employment No SE(B)170



**SURREY – PARIS – HOLLAND**  
*Programming Consultants to £7,000*  
*Project Leaders to £9,000*



We are looking for high level programmers and technical consultants with several years COBOL programming experience and a keen understanding of computer systems. Experience on any of the following equipment:

Honeywell (GCOS), Univac 1100, IBM 360/370, ICL 1900, large 2900s, System 4, CDC Cyber series would be very attractive. Previous conversion experience would be useful.

Candidates for the Project Leader positions should have had some supervisory experience and project team responsibility.

Applicants for overseas projects must be independent, mature and realistic about problems and willing to adjust to a new environment. For the Paris project a reading knowledge of French is required.

All employees are based in the Richmond office where they will receive on the job training. Assignments to overseas projects will be for varying periods.

Competitive salaries will be supported by a generous tax free allowance whilst overseas, and there are further tax advantages to working abroad. All fees will be paid and benefits include non-contributory pension and life assurance schemes. BUPA and permanent health insurance.

This is an opportunity to join highly professional teams in a young and dynamic environment with a company that is rapidly expanding. **Ref: 527/CW/Renée**

***For further details please contact Renée Nuta on 01-242 9356. If it would be more convenient to telephone in the evening, the telephone number is: 01-874 6372.***



Members of  
Computing  
Services  
Association

Iran Air requires a Senior Programmer / Analyst with a minimum of five years' programming and design experience on mini-computers, preferably IBM SYS/32 on financial applications; Based at Pictorially the position offers a wide scope for travel and the development and development of an on-line accounting package.

We offer a good competitive salary with many fringe benefits, working conditions are excellent and there are valuable travel privileges.

Please write (do not telephone) with personal and career details to the Personnel Department, Iran Air, 73 Piccadilly, London, W1V 6QK, marking the envelope "Senior Analyst".



**IRAN AIR**  
The world's fastest growing airline

Applications are invited for the above post which will involve working 20 hours per week. Duties of the appointment will include maintenance and development of software for the Department's Computer and assistance to students. Experience with a PDP-11 would be an advantage.

Starting salary will be based on the following scale: £3,199.00-242 per annum.

Further particulars are available from the Secretary, RCUA, University of Stirling, Stirling, FK9 4LA, to whom applications, together with the names and postal codes, should be sent by 18th August 1978. An appointment is hoped to be made by October 1st, 1978.

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If you have the TIME we use the PLACE!  
CALL US CONSULTANTS now!  
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 Get a year exp. or less? Move  
 now and get a real  
**ALL AREAS**

**ICL 2203, 32K EDS 50s**

...of application listing age, experience, qualifications and present salary should be submitted.

TOWN CLERK AND CHIEF EXECUTIVE'S DEPARTMENT

Applications are invited from suitably qualified/experienced candidates for the following posts

**A. SHIFT SUPERVISOR** Plus shift allowance 12 postal Ref CE262/CW 24,017,23,25

**B. COMPUTER OPERATOR** Ref. C2202/CW  
Plus shift allowance (1 post)

**C. TRAINEE COMPUTER OPERATOR**  
Plus shift allowance 12.00

**YOU SHOULD HAVE —**  
Two years' experience (A) or 18 months' experience (B) or 12 months' experience (C) or 6 months' experience (D) or 3 months' experience (E) or 1 month's experience (F) or no experience (G). "O" levels or equivalent (IC). knowledge of hardware (A & B). trained using DOS/DS and PowerV/S (A & B). a good standard in education (A & B).

**WE ARE OFFERING —**  
Competitive salaries, five weeks' annual holiday, a two shift system (three for shift supervisors which includes a 9-5 shift), subsidised restaurant and free car parking, voluntary overtime, latest equipment and software, friendly local environment, sporting facilities.

**THE INSTALLATION —**  
IBM 370/138 (½ megabyte), 3340 disks and 3410 tape.  
DOS/VS Power/VS, interesting and varied applications.  
Orthomching up-gredus include 3344 disks and 3420 tape.  
elfa-processing (local and remote).  
For informal discussion contact Drddley Boson on 890 4343  
extension 250.

Application form, returnable by August 11th, and detailed job description from Civil Personnel Officer, Town Hall, Canford, London SE6 4RU, or telephone 01-69D 7868 (24-hour telephone service), quoting appropriate reference and job title.

Ray Weston, Osmini Computer Systems Ltd.  
Roberts House, 80 Manchester Road  
Aldershot Hants GU11 4PL  
Tel 081 541 1022

## Systems Analysts & Analyst/Programmers

£5000 — £6000 + JOB SATISFACTION

SCOTLAND



Our client is a major international company manufacturing sophisticated electronic products and fully committed to a high level of Systems Development. The MIS Department is embarking on a major new phase of development and now requires to strengthen the team with additional Systems Analysts and Analyst/Programmers.

A high degree of Job Satisfaction is offered in the:

- Implementation of advanced manufacturing control systems using on-line/real time techniques.
- range of applications from production control to purchasing, quality assurance financial administration and personnel.
- establishment of a complete network of VDU's throughout the manufacturing complex.
- use of Data-base management systems to service the company's information needs.

In terms of rewards, we will provide:

- excellent negotiable salary
- payment for overtime

- 28 days holiday
- active sports and social club
- excellent promotion prospects.
- contributory pension and assurance schemes
- first class relocation package
- 35 hour week
- In-plant dining facilities
- The opportunity to live in one of the most attractive parts of Scotland offering every leisure facility and quality housing for purchase or rent.

If you would like to know more about this exciting career opportunity, write to the address below.

(Ref: E5808 / CW)

REPLIES will be forwarded direct unopened and in confidence to our client unless addressed to the Security Manager listing companies to which they may not be sent. They should include comprehensive career details not refer to previous correspondence with PA and quote the reference on the envelope.

## PA Advertising

127 George Street, Edinburgh EH2 4JN. Telephone: 031-225 4481



A member of RA International

هَذَا مِنْ أَصْلِ



## GHANA SYSTEMS MANAGER

Ashanti Goldfields Corporation (Ghana) Ltd.

A vacancy exists for a Systems Manager with in-depth knowledge and extensive practical experience of Systems Design and Programming in Plant Data and I.C.L. 1901 Driver. This appointment will involve:

- Preparation of detailed systems and programming specifications
- Guidance, advice and counsel to programming staff
- Training of local staff in practical systems design and analysis

The installation comprises an I.C.L. 1901T Computer, 48K, with E.D.S. 60 and local visual display terminals with terminals. The successful applicant will head the project to redesign existing magnetic tape systems to operate effectively in a disk and communications environment. Ideally, past experience will have been gained in a small installation where the applicant has been fully involved at all stages of the systems, programming and operational implementation. Experience in working overseas and possession of formal computing qualifications will be an advantage.

Starting salary about £11,000 p.a. (equivalent to present rate of exchange).

Conditions of service are in line with modern thinking and include:

- 5 year contract
- 15 months foreign tour with 3 months' leave
- Free furnished accommodation
- Family passages and tour
- Provident, gratuity and life assurance schemes
- Staff primary school/education allowances
- Good sporting facilities

Please write in confidence to: —  
A. Orchard, Group Personnel Manager,  
LONRHO LIMITED,  
Chapside House, 138 Chapside, London, EC2V 6BL.

## Systems Analysts to £5,500

### On-Line Developments - Sussex Coast

Situated within easy reach of Brighton (10 miles) and Worthing (3 miles), Eschmann Bros. & Welsh Limited, is an international supplier of health care products, and a member of the highly successful Glaxo Pharmaceutical Group.

Our existing computer (ICL 1901) plays a vital role in the planning and transaction of the company's business, and proposals are in hand for the significant extension of its influence, particularly in the manufacturing area. Plans are also at an advanced stage for the up-grading of the current equipment to a 2904, Model 50, with a firm commitment to On-Line working. Opportunities are provided for suitably experienced personnel to contribute to these challenging developments in a relatively small and friendly company that enjoys large company benefits, e.g. — Annual profit sharing bonus — Generous relocation expenses where appropriate — Pension and sick pay schemes.

Details and application forms are available by telephoning or writing to: Personnel Officer, Eschmann Bros. & Welsh Limited, Commerce Way, Lancing, West Sussex BN16 6UP. Tel: Lancing (09083) 62281, ext. 37.



### UNIVERSITY OF SALFORD COMPUTING LABORATORY

Applications are invited for two senior posts in the User Services Section of the Computing Laboratory.

#### ASSISTANT DIRECTOR (Head of User Services) CL/83/CW 7574-13730

#### SENIOR COMPUTING OFFICER (User Services) CL/84/CW 18544-73358

The group is responsible for the provision of applications software, documentation and user support within the laboratory. Applicants for both posts should have a good honours degree and several years' experience in an area of computing relevant to the work of the section.

Further particulars and application forms may be obtained from the Director, Salford University, Salford M6 6PU, and should be returned by 21 August, 1978, quoting appropriate reference.

### QUEEN MARY COLLEGE University of London

#### ELECTRICAL AND ELECTRONIC ENGINEERING DEPARTMENT

#### COMPUTER PROGRAMMER

This appointment offers opportunity to develop various skills and to be involved in the development and maintenance of programs supporting research and teaching using University, College and Departmental computers. Applicants should have a Science or Engineering degree with programming experience (preferably FORTRAN) and possess an assembly code. Appointment for 3 years in first instance, on scale £3100-£5262 p.a. (higher reward, plus £450 London Allowance). Please apply, enclosing curriculum vitae and names of two referees, to the Registrar (CWN), Queen Mary College, Mile End Road, London E1 4NS, not later than 11 August.

#### PROGRAMMER

Applications are invited for the above post in the School of Computing Studies to take effect from 1 October, 1978. The successful applicant will be responsible for providing programming and general computing support to members of the academic staff in the School. Preference will be given to candidates holding a degree in Computing or having appropriate professional qualifications.

Appointment will be to the scale £3100 to £5262 (under review) plus £450 London Allowance. Applications should be made, together with the names and addresses of three referees, to the Registrar, School of Computing Studies, University of East Anglia, Norwich NR4 7TJ, from whom further particulars may be obtained, not later than 1 August, 1978. No forms of application are used.

#### COTSWOLD DISTRICT COUNCIL COMPUTER OPERATOR

Salary: Scale rising to £3,275 p.a. (minimum payable at age 21 — £2,825).

The Council requires a Computer Operator to work in its computer installation in Goodrich Street, Cirencester. The successful applicant will be responsible for the operation of the system, including the preparation of reports and the maintenance of the system. The successful applicant will be required to have a degree in Computing or a similar qualification, and a minimum of two years' experience in a similar position. The successful applicant will be required to have a good knowledge of the English language and to be able to communicate effectively. The successful applicant will be required to have a good knowledge of the computer system and to be able to operate it efficiently. The successful applicant will be required to have a good knowledge of the system and to be able to operate it efficiently. The successful applicant will be required to have a good knowledge of the system and to be able to operate it efficiently.

## Computer Operator....

...who wants to be a Programmer.

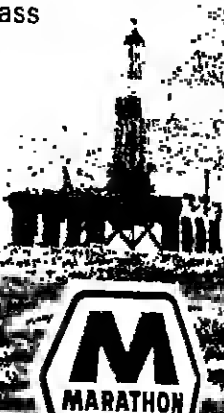
This is your opportunity not only to be trained as a Programmer, but also to work for an international oil exploration and production company, which is expanding rapidly in the U.K.

Initially you will operate a Datapoint 6600 computer terminal, including graph plotter and digitizer, which is on line to an IBM 370 mainframe. Because you must be able to take responsibility for running the system unaided for much of the time, you will need up to a year's experience as a computer operator. The positions are on a two shift basis.

We will offer a very attractive salary with top class benefits. The right man or woman will receive training as a Programmer, so career prospects are excellent.

Please phone for further details and an application form, or write to:

Tania Edwards or Howard Statham,  
Marathon International Petroleum (GB) Ltd.,  
Pan Ocean Oil Corporation,  
35/38 Portman Square, London W1H 0BN  
Tel: 01-935 3713.



## George 3 Specialist

Melbourne,  
Australia

A\$13,000-  
\$16,000

An opportunity exists for a George 3 specialist, who has preferably had some experience in a sales support role. Your specialist knowledge will be utilised in supporting IBM and 2901 George 3 sites of which there are currently six in ICL Australia's Southern Region. You will work at a technical level and, from time to time, will be required to use your diagnostic skills. You will also provide general systems support to a group of users in the solution of day to day software problems.

This is a permanent position and assistance with relocation will be given. If the wide horizons we can offer in Australia attract you and you can meet our requirements, then write without delay to Carmel Hudson, ICL Bridge House North, Putney Bridge, London SW6 3JX, quoting reference CW1941, (Tel: 01-788 7272 ext 2047).



## ata Computer Recruitment

### HOME COUNTIES

#### SYSTEMS AND PROGRAMMING SUPERVISOR

circa £6,700 p.a. + car

World-wide manufacturer and Distributive Group seek a Systems and Programming Supervisor to head a small team responsible for the review, design and development of U.K. group systems to interface with the International O.P. Network. Ideally candidates will have experience of Burroughs Hardware but enquiries are invited from persons with similar responsibilities seeking new horizons.

#### YOUNG AND WANT TO GO PLACES SUCH AS OVERSEAS?

A leading, independent Computer Consultancy is offering a number of opportunities to Programmers with at least 2 years' R.P.G. 11 experience, to join their expanding, specialised organisation. Initially you will be based in the U.K. to become familiar with the organisation and thereafter the opportunity will be given to work in their various offices abroad. Salary £5,000 to £6,000 p.a.

#### CO-OPERATIVE AND AMBITIOUS?

£5000 to £8000 p.a.

Private trading company wishes to increase their O.P. department and are currently seeking two programmers with between one and two years' experience of PL/1.

The present system is an IBM 370/115 under Power VS, with Shadow as the TP monitor to a 3741 in New York. First-class fringe benefits include financial assistance in House Purchase, interest-free season ticket loans and £1 LVA per day.

For further details please phone Steven Morton on 01-637 0781 or alternatively write to ATA COMPUTER RECRUITMENT, 230 Gt. Portland Street, LONDON W1N 5HG.

LONDON (01) 637 0781  
230 Gt. Portland St. W1N 5HG

MANCHESTER (061) 632 5656  
86 Cross St. M2 4LA

BIRMINGHAM (021) 643 1994  
Woolworth Building, 102 New St.  
B2 4HQ

BRISTOL (0272) 21 1035  
Equity and Law Building  
36/38 Baldwin St. BS1 1NR

EDINBURGH (031) 226 5361  
Anglia House, 24/26 Frederick St.  
EH2 2JR

CRAWLEY (0293) 514071  
36 The Broadway

### WEST COUNTRY

#### CUSTOMER SUPPORT ANALYST

Neg. to £7,000 + car

Major Mini Manufacturer requires an additional Analyst to be responsible for a major account in the Bristol Area. Candidates should be of Project Leader/Consultant status with experience of real-time systems.

#### PL/1 PROGRAMMERS

to £4,500 + subsidised mortgage

The West Country has always been recognised as a Major Finance and Trading Centre and because of this tradition the demand by the various institutions for experienced programmers is high. We would like to hear from PL/1 Programmers at various levels to discuss the various career paths open to them.

#### COBOL AND/OR PLAN PROGRAMMERS

to £6,000

Programmers with a minimum of 12 months' experience gained preferably in a commercial environment to work on Systems development.

Promotion by merit — locations: BRISTOL, BATH, POOLE, PLYMOUTH and CENTRAL DORSET.

The above positions in many instances also offer substantial RELOCATION ASSISTANCE.

For further details telephone or write to IAN BAKER on 0272 211035.

ATA COMPUTER RECRUITMENT  
Equity & Law Building  
36/38 Baldwin Street  
BRISTOL BS1 1NR

# Unlimited territory for a very rare species

Database Specialists to £10,000 plus car

A leading company needed a nationwide computer system — to be developed from scratch to handle its entire sales, service, spare parts and accounting functions. Perhaps a network of ten dispersed minicomputers would provide the most economic solution. Perhaps more than twenty. Could you evaluate a requirement like that? Or design the distributed database?

One of the country's fastest growing insurance companies required an online database system, to cover all aspects of its business. Could you design a highly complex database containing 1500 Mbytes of data? Or solve the recovery problems inherent in online access to arch data volumes? Could you design the transaction processing monitor? Or

estimate the response time under widely differing loads?

Date Logic is looking for consultants and system designers for these and similar projects. Current assignments include work for banking, manufacturing and distribution, and public sector organisations. Technically, the scope of work should give unlimited opportunities to the right people.

The experience and personal qualities we need are extremely rare. Preferably, candidates will have a degree in computing science or a relevant discipline. They will have spent at least five years on the design and implementation of database management systems — on minis or mainframes. Ideally, this will have been with a computer manufacturer

or a software product company, although work with a software house or a major user of an online database system will also be of interest. Candidates will have the ability to work with a minimum of supervision, and to deal effectively with senior management in client companies. Detailed knowledge of one of the following will be a distinct advantage: IMS/PL1, TOTAL, DMS2, IDMS, IDS, ADABAS.

We know we are asking a great deal. In return we offer a salary of up to £10,000 p.a., a share in the profits of the country's most profitable software company, contributory pension scheme and a company car.

Why not call or write to arrange an informal meeting? We would like the opportunity to describe the challenge and rewards of working for Date Logic. And you'd probably like it confirmed that you are as rare as you think.

If you are some of the way to meeting our requirements, we would also like to hear from you. Prospects could be equally exciting and a Date Logic progression to the highest positions comes quicker than practically anywhere else.



Call or write: W. D. Barrow, Data Logic Limited, FREEPOST, Westway House, 320 Ruislip Road East, Greenford, Middlesex UB6 8BR. Telephone 01-678 9111

### NALGO Requires:

#### DEVELOPMENT OFFICER

Salary £5,797-£8,361 p.a. (under review). Applicants should have two years' in-depth system analysis experience and ability to communicate effectively with user departments. Must be well motivated.

#### 2 PROGRAMMERS

Salary £4,780-£5,060 p.a. (under review). Applicants should have two years' Cobol experience on ICL 1900/2903.

To work on ICL 2904 (40K, Telex, EDS, 804, and D.E.E.). Applications include financial, insurance and insurance building society, wages, etc. Minimum of 26 and 23 days annual leave respectively for these positions and additional leave of public holidays. Pension mortgage interest relief, contributory pension scheme. Staff restaurant. Salary increases operative from 1st July, 1978 are currently being negotiated. Requests for application forms and further information should be sent to:

The General Secretary, National and Local Government Officers' Association, 1, Madison Place, London WC1H 9AU.

Closing date 31st August 1978.

SPEND  
12-18 MONTHS  
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RETURN TO A  
CAREER POSITION  
IN THE

UK

#### ANALYSTS & PROGRAMMERS

OPPORTUNITY TO GAIN 370 TRAINING AND EXPERIENCE ON AN EXCITING 12 YEAR VISIT TO AMERICA

Join INFORMATICS INC., a prestigious world-wide consulting company. Initial assignments will be in the U.S. as part of our program of Orientation, Training and Return to our British operation. We have recently opened a London office and have opportunities upon your return.

EXCELLENT SALARIES & GENEROUS RELOCATION ALLOWANCE INCLUDING FULLY PAID RETURN FARE EXPENSE PAID INTERVIEWS

LONDON, JULY 27th  
To arrange a confidential interview send resume immediately, or phone our UK representative, E. Levine, beginning Monday, July 24th (reverse charges accepted).

E. Levine, Royal Lancaster Hotel, Lancaster Terrace, London W2  
Tel: 01-462 6737.

#### COMPUTER PROGRAMMER

Bestrom Division of UOP Limited is the world's leading manufacturer of suspension seating for the truck, tractor and industrial equipment markets.

We are currently seeking an experienced programmer to join our small, but expanding D.P. installation, which utilises an IBM System 3, Model 12.

The successful applicant will have a minimum of two years' programming experience, using RPG II, and will probably have worked in a manufacturing environment. Commencing salary will be dependent upon age and experience, and the company offers a wide range of benefits, including 28 days' annual holiday and contributory pension scheme with free life assurance benefit.

Please write or telephone for an application form to Mrs. P. Cowgill at the address below:

Bestrom Division  
UOP Ltd.  
11 Watney Road, Leeds LS11 5JL  
Tel: 0532 445555





## Communicate with Racal

### Great Opportunities in Data Communications

#### Sales Executives (NEW PRODUCTS)

#### Area Sales Engineer

#### Product Applications Engineer

**RACAL**

Racal-Milgo Ltd, a member of the internationally famous Racal Electronics Group, is a world leader in the field of Data Communications. The Company's outstanding success and current expansion of its product range, gives rise to the following vacancies.

#### Sales Executives

To join the new division marketing computer controlled voice response systems for data entry and file enquiry applications.

Applications are sought with proven sales ability and familiarity with data processing, consultancy, bureau or hardware software. Positions will be based in either the Reading or Manchester offices.

#### Area Sales Engineer

To operate in the South East from the Reading headquarters of the highly successful UK Sales team, selling Data Communications equipment to computer-based users.

Applications (male or female) should write with details of age, qualifications and experience, to: D J Kichenside, Personnel Officer, Racal-Milgo Limited, Prospect House, Thorn Street, Reading, Berks.

Preference will be given to applicants with direct selling experience in data processing, Communications or electronics.

All sales positions carry attractive base salaries plus generous commission and company cars.

#### Product Applications Engineer

To join the Engineering Group giving product support to the UK Sales Team.

Degree, HNC qualifications are expected plus experience in design and development using digital and analogue techniques. Direct experience in Data Communications and competence in software assembly level would be an advantage.

A competitive salary commensurate with experience and ability will be paid.

The Company offers nearly five weeks annual leave and membership of a first class contributory pension scheme with free life assurance.

## Western Europe Software Holland £8,500 - £16,000

We are actively recruiting programmers, analyst programmers, Consultants and Senior Consultants for career appointments in Western Holland. The environment you will encounter is one where high quality software design and implementation is essential, and it is important you wish to be involved professionally with individual customers' systems. The company is already established as a leader in its field and expansion planned is considerable throughout Western Europe. We are particularly interested in career-minded people who have had experience in an on-line, real-time environment, or switching or networks using mini-computer based systems. Projects you will encounter will be extremely varied, often extensive and usually sophisticated. Successful candidates can expect a competitive continental salary (generous tax concessions can also be applied for), interesting and worthwhile job content, excellent conditions of employment and benefits associated with a prestige company.

Telephone me, Bill Seymour, for further details; interviews with our client will take place in London during the first half of August.

Bill Seymour 01-637 5001

U.K. Office, Portland House, 4 St. Portland St., London W1N 5AA  
Andrew Ellis, Sarphatistraat 30, Amsterdam, Holland, Tel. (020) 264864

**Accord Computer Efficiency**

The Dynamics Group of British Aerospace has evolved from the best expertise and engineering knowledge being applied in this country to the design, development and manufacture of guided weapons. One of the spin-offs of our work in this field is the ability to produce Automatic Test Equipment (ATE) of the highest standard. To help us to continue our expansion programme, we are looking for people of various disciplines to work on ATE.

### Group Leader - Programming Systems

The Software Facilities Department of our Automatic Test Systems Group has as its main functions the provision, maintenance, enhancement and operation of the software management and data-handling facilities required to support the generation of application and self-test software for Automatic Test Equipment. This involves compilers, editors, emulators, translators, and a dynamic management and data-handling system to serve the needs of the ATE Engineering Department.

Within the Department, we have a vacancy for a Group Leader to be responsible for two teams of Programmers, one working principally in Cobol on an IBM 370/158, the other on mini- and micro-computers in Assembler and Corel.

Candidates should have varied experience and be competent in both project and man management. In addition, ability to understand an end-user's needs will be useful.

### Software Systems - Microprocessors

Weapon systems use digital processing power and, with the advent of the micro-computer, this use will extend and the applications will become more complicated in the search for improved performance. The systems will use mini-computers and micro-computers involving distributed processing, real-time, multi-processor and multi-tasking technologies, with full high-level language and host computer support.

We need software system engineers/consultants to assist our Engineering Teams in tackling a whole new range of problems in the system design, assessment and test areas arising from the move from analogue to digital systems. Your background will be in Control Engineering, Electronic Engineering or Computing Science, to graduate standard, and you will have experience with mini-computers or micro-computers, including programming in a high-level language (preferably Corel).

### Automatic Test Equipment

We have vacancies for people who can design and develop electronic test equipment, generate the technical requirements for test sets and analyse the associated documentation, and then verify the integrity of the test package. There are also vacancies for similar people to work on mechanically orientated test equipment.

We require software people who are used to solving test engineering problems and who wish to apply their expertise to programming ATE and also people with experience in developing system software with an application in solving engineering problems. If you are familiar with any of the following, you could work on our executive software: Systems analysis, High-level language compilers, Assembler language, and Disassembling systems.

The salaries offered will reflect the importance of the position. Interested candidates are asked to send their career details or write for an application form to:

Mr. P. C. Ellinger  
Ref: A511, Personnel and Training Dept., Site A  
British Aerospace Dynamics Group  
Stevenson-Bristol Division  
Six Hill Way  
Stevenage, Herts, SG1 2DA  
Telephone Stevenage 2422, Ext. 3129

**BRITISH AEROSPACE**  
**DYNAMICS GROUP**  
**Stevenage**

### WORLD SHORTAGE OF PROGRAMMERS

We need several more programmers to help us keep our lead in the World Processor market. We design and write assembly code programs for 8080 and Z-80 microprocessors. You can have any job title you like (except, perhaps, Director), provided you can write code and make it work.

Experience of microprocessors would be useful - but isn't essential. We prefer working with graduates - or at least people of an equivalent standard. The main qualification is: however, the ability to produce useful programs from a minimum of specification - after all, if we tell you exactly what to do we might as well write the code ourselves.

If you want to know more about working for this small company in Sunny Dorking, then ring Chris on Dorking (0305) 87789.

DATA RECALL LTD.  
Sunny Dorking, Surrey



### JUNIOR PROGRAMMERS

c. £4000 p.a.

I.B.M.: 370-138, DOS-VS, CICS, SPMOL

The Computer Services Department at The Royal Borough of Kensington and Chelsea was formed during 1977. An opportunity now exists for two Junior Programmers willing to develop their programming careers in a progressive systems development environment, utilising the latest computer facilities and proven standards.

The Junior Programmers will be working in a project team environment, coding and testing programs in COBOL and possibly RPG II.

Applicants should have received basic training in programming and have gained at least 6 months' COBOL programming experience.

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Application form quoting Ref. CW/662 from the Establishment Officer, Department 151, The Town Hall, Hurlingham Road, London W8 7NK. Tel. 01-837 8862 (24-hour answering service). Application form to be returned by 1st August 1978.

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Our client, a major American Bank based in London, is expanding its operations staff to cope with increasing workloads and new hardware. They operate an IBM 370 using POWER and CICS plus multiple PDP 11s for a variety of communications applications.

Applicants for the Senior vacancies must have a minimum of 2 years' experience on either IBM or PDP equipment and 12 months is the minimum for the Junior positions. If you have knowledge of both types of equipment, then you may qualify for a higher salary than that quoted.

In addition to the excellent salaries the positions also carry considerable additional benefits including free lunches, season ticket loans, non-contributory pensions with subsidised mortgages and cheap personal loans after a qualifying period.

To learn more about these exciting job opportunities, phone CAROL McGOVERN on 01-836 6776.

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An expanding bureau has a vacancy for a broadly experienced systems analyst to work on in-house/customer situations. If you wish to gain more general experience then you should learn more about this position.

### SOUTH BRADFORD BUSINESS

ANALYST £5,500  
Well-run DP department requires a business analyst to liaise with user departments and develop their requirements. This position would suit an analyst with systems rather than technical interest.

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For an analyst with payroll systems or package experience our client will pay £5,000. Initially you will have responsibility for all payroll systems in the company with a view to becoming a specialist.

### HALIFAX DP CONSULTANTS

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Our client is forming a DP consultancy group within its already established services organisation. Positions of challenge and opportunity available to experienced DP professionals.

### WEST YORKSHIRE SALES

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Bureau services - you will sell our client's bureau services based on a range of developed packages £10,000 + CAR.

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Our client has several exciting packages now being marketed to specific industries. These packages are leaders in their field. Earnings over £10,000 + CAR.

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"If you're considering a move then you should contact Lorian first"

### LORIAN COMPUTER SERVICES



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Leading European Management Services Group requires professional experienced people for contracts in Europe and elsewhere. German/Dutch reading capability is useful.

Please write for our details to:

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Salary: £2727 per annum including supplements. A second post is available in one of the above areas for which a Science Research Council Studentship is available.

Further details and application forms are available from the Establishment Officer, North Staffordshire Polytechnic, College Road, Stoke-on-Trent ST4 2DE.



# RPG II PROGRAMMER/ PROGRAMMER ANALYST

for the post of

## DEPUTY DP MANAGER to £7,300 NORTH LONDON

Our Clients, the largest manufacturers and distributors of musical instruments in Europe, are looking for a Deputy Manager for their ICL 2904 computer department. In this post you will manage a small team of programmers and will be expected to take over the day-to-day running of the department in the absence of the Manager. You will naturally liaise closely with the Data Processing Manager, helping to define systems specifications and laying down long term plans and budgets.

The Group are about to develop two major systems:

- ★ An on-line order processing system including invoicing, sales forecasting, re-ordering, etc. This system, which at present is limited to local VDUs, will shortly be enhanced to support remote locations.
- ★ A Bill of Material Processor supporting factory operation. It is intended to expand this system substantially to embrace most aspects of factory management

For this important position of Deputy DP Manager, you should be experienced in RPG II and ideally have the following attributes:

- ★ The ability to lead a team of programmers.
- ★ Detailed knowledge of at least one commercial system
- ★ Have written program specifications and probably designed programming standards
- ★ The ability to communicate with management

Here is an ideal opportunity for an experienced programmer to take a management role in an expanding computer department whose offices are located in an extremely pleasant residential area in the North of London. The Company offers all normal benefits associated with a large organisation.

Ref. CW/47/1

Should this position interest you, please phone ROY HIGHFIELD, Advising Consultant, for further details or preferably to arrange an interview.

HUTTON EXECUTIVE SELECTION LTD.  
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HUTTON STREET LONDON EC4A 3BH

TELEPHONE 01-353 7141 (241 HOURS)

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## SALES EXECUTIVES AND SUPPORT STAFF FOR U.K. AND IRELAND

Our Clients, one of the world's leading manufacturers of computers, are recruiting to meet a continued expansion within the U.K. They have a product range encompassing stand-alone processors to full distributed intelligence. They are an aggressive company but the balance sheet management is conservative and the controls are excellent. They have asked us to look for dynamic staff to work out of their offices in LONDON, BRISTOL, BIRMINGHAM, MANCHESTER and DUBLIN.

## SALES EXECUTIVES QUOTA EARNINGS TO £12k NO LIMIT ON TOTAL EARNINGS UP TO 18 MONTHS' GUARANTEE (NON-RECOVERABLE) COMPANY CAR

We are looking for successful sales executives, preferably with experience in computer or telecommunications systems on mini or main frame computers. Alternatively peripheral, software or bureau sales personnel would be considered, especially with a broad-based applications knowledge. You will be expected to be self-motivated, ambitious and a proven ability to sell against quota.

## SYSTEMS SUPPORT ANALYSTS CIRCA £6,000 + BONUS COMPANY CAR

We are looking for ambitious men or women with a wish to work in a sales environment. You should have experience in ASSEMBLER, COBOL or FORTRAN, knowledge of operating systems and a general hardware understanding. You will be at present working in a user environment or with a manufacturer and be looking for a more challenging career and exposure to customers.

## TECHNICAL SUPPORT ANALYSTS CIRCA £7,000 + BONUS COMPANY CAR

This particular post will be of interest to experience computer or peripheral engineers looking to widen their experience. You will be expected to provide technical guidance to field engineering staff, solving the more complex maintenance problems, trouble-shooting and being involved with on-job training. You will also be expected to maintain a specialised knowledge of the company's products.

Ref. CW/47/2

Applications will be treated with the strictest confidence and should be made to ROY HIGHFIELD, Advising Consultant.

HUTTON EXECUTIVE SELECTION LTD.  
HUTTON HOUSE  
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## NEW TECHNICAL SUPPORT POSITIONS IN OUR PROFESSIONAL SERVICES DIVISION

Our Professional Services Division provides a wide range of consulting services to Industry, Commerce and Government - both independently and in support of our Systems and Data Services divisions. These new positions arise in expansion of our technical support group involved in pre-/post-sales assignments.

### WHO IS CONTROL DATA?

We are a computer company employing 41,000 people worldwide.

We have a firm commitment to the computer industry, the United Kingdom and the training and advancement of people.

We are a world leader in the provision of computer services, large-scale computers and peripheral equipment. This position is continually strengthened by our ongoing investment into more advanced products and services. Such a range of activities presents considerable scope for the advancement of personnel at all levels and disciplines.

We offer a challenging and rewarding career opportunity with involvement in software development, installation and support, together with some sales-related activities in the areas of system configuration and benchmarking.

We are looking for technical people of the highest calibre and offer salaries and associated benefits commensurate with the demands of the post.

If you have the qualities and experience we are seeking - please read on.

### WHO ARE YOU?

YOU will be intelligent, enthusiastic, articulate and self-motivated.

YOU will be at least 25 years' old with several years' systems software experience. A knowledge of Control Data's Cyber 170 operating systems, particularly NOS/BE, would be advantageous.

YOU may have a degree in computer science but more essential is a sound knowledge of operating systems, the ability to quickly comprehend new concepts and to communicate with customers.

YOU may expect the possibility of travel in the U.K. and Europe.

Please write to Mrs. Margaret Spence with full details of your career to date. Professional Services Division, Control Data Ltd., 22a St. James's Square, London, S.W.1. Telephone 01-930 7344.



MORE THAN A COMPUTER COMPANY

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### BASIC PROGRAMMER/ANALYST-£5K PLUS

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There are six of us at present, and we work in APL and BASIC on time-sharing systems and minis. Clients range from small businesses buying their first computer to multi-nationalities with interactive systems (mainframe) - all over the world.

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### COURSES

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AND MATHEMATICS

BRITISH COMPUTER SOCIETY  
PROFESSIONAL EXAMINATION  
PART I AND PART II

6 term courses are offered on a day release and evening only basis for each part of the examination leading to

Membership of the Society (MCS).

Suitably qualified candidates can enter directly on to the second year of the Part I course.

In addition, the department offers several short courses in aspects of computing and

HIGHER NATIONAL DIPLOMA IN COMPUTER STUDIES (BSc Honours and Full-time)

POLYMATHS

The Polytechnic's national course, giving a new alert in mathematics to mature students. Study is part-time evening.

Enrollment dates for the above courses: 13th, 12th, 13th September, 1978.

Further details can be obtained from the appropriate Course Tutor, Department of Computer Studies and Mathematics, Franchise Street, Park Street, Birmingham B2 4 2BU.

Telephone 01-252 8911.

Application forms for the H.N.D. Course available from City of Birmingham Polytechnic, Franchise Street, Birmingham B2 4 2BU.

## Systems Analyst

Oil exploration c £8000

Tricentral Limited is a British company exploring world-wide for oil, gas and minerals. Production outside North America is controlled by Tricentral Oil Corporation which, since the Thistle Field in the North Sea came on stream earlier this year, is not only expanding its exploration but also making increasing use of its computer facilities.

Tricentral Oil Corporation needs a systems analyst experienced in Tabul and Fortran on Honeywell Mark III time sharing systems with a knowledge of Basic using IBM Cull 800 systems for the following applications:

- financial and cost accounting
- exploration economics
- forecasting

Graduate preferred. Age is less important than communicative skills and speed of reaction to the demands made on a young, small but growing department.

Location London. Salary negotiable around £8000.

Please write in confidence for a job description and an application form to: David Prosser, Executive Selection Division, Southwark Towers, 82 London Bridge Street, London SE1 8SY, quoting MCS/8705.

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Computer Weekly  
IPC Business Press Ltd.  
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Tel: 01-261 8022

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Send curriculum vitae to Division of Personnel, International Atomic Energy Agency, P.O. Box 590, A-1011 Vienna, Austria, not later than three weeks from today.

## THE SALES BIT

### PROSPECTING (3)

## The protective secretary

ONE of the natural hazards of establishing contact with a new business prospect is the "protective" secretary. "Mr Prospect is in a meeting at the moment" must be a familiar cry to many a salesman.

The immediate reaction of most salesmen is to think of ways around this natural obstacle. I have seen salesmen driven to desperate actions by the sheer frustration of finding all normal methods of communication blocked: confidential telegrams, disguised voices, knocking on the door, and so on. One can only admire the determination and ingenuity of such efforts, but often they become necessary through lack of subtlety and common sense from the outset.

The attitude of the salesman towards secretaries is particularly important in this context. Secretaries are not the chattels of their masters; they are people performing an essential secretarial function. Many are in the job because they have decided upon a business career rather than a domestic one, and as such are typically very independent. Ideas may be repelled badly to male chauvinism. Therefore, any hint of patronisation, arrogance, condescension, flattery, or chatting-up techniques, is bound to introduce communicative barriers. If the salesman starts out by attempting to work with the prospect's secretary rather than getting past her, he will ultimately have fewer problems.

The first stage is to discover the secretary's full name, while remembering to use only her surname in the first instance. The salesman needs to show respect in order to gain it, and a Christian-name mode with a stranger is never advantageous.

Having discovered who the secretary is and how to address her, the next step is to recruit her assistance and the best way to do that is to ask for it. Obviously, the only help the salesman really needs at the outset is to be put through to the prospect, but if this results in resistance only then the salesman needs to become involved in more specific reasons why the secretary should help him meet her boss.

Often, by simply stating his situation and a need for assistance, while stating an appreciation of the secretary's responsibilities, the salesman can achieve positive results.

For instance: "I am sure Mr Prospect is constantly approached by salesmen wishing to sell to your company, and he doesn't have time to see them all. I realise it is part of your job to help him select those salesmen whose products could bring most benefit to your company."

"The computer system I need to discuss with him is not only bringing significant benefits to some of your competitors, but is also closely allied to company policy and only he could decide the validity of the advantages involved."

"Is it easier to contact him at the beginning or the end of the week? Does he tend to be more readily available in the morning, or the afternoon?"

In other words, the salesman should make the secretary realise that he appreciates her importance while at the same time introducing a decision criterion outside her scope, thus demanding the involvement of the prospect which in turn should require a meeting. Company policy and competition are useful devices in this context, and an "optional close" on the best time to call does no harm at all. Having said that, it is clearly better for the salesman not to get involved with the prospect's secretary other than at the courtesy level.

Often the manner of the salesman's approach can get him straight through to the prospect without any resistance from his secretary. It is, therefore, important that his attitude is bold without being familiar, thus suggesting an existing business relationship between the prospect and himself.

Of course, the salesman cannot be sure that the prospect will be in the office when he calls. In this situation it is best to ring off, after establishing the best time to call again, avoiding any further discussion with the secretary.

In his eagerness to sell he might just sell himself out of a reason for calling again.

### TRADE

## Survey of 100 US word processors

AN exhaustive survey of over 100 different word processors is available in a 70-page booklet from Computer Information Services, London. Called "All about Word Processors," it costs £10 and is a selection from a larger "Manual of Word Processing" looseleaf information service.

The full manual costs £200 plus £200 a year for its monthly updating service. Only word processors available in the US are covered. CIS is based at 288 Pentonville Road, NI.

### PC brochure

AN illustrated brochure of printed circuit systems has been published by Ferranti Cete Graphics. It describes the specialised equipment developed and produced by Ferranti for manufacturing artwork needed for printed circuit production. Copies are available from Technical Sales Office, Ferranti Cete Graphics Ltd, Ferry Road, Edinburgh, EH5 2XS.

### Puzzle answer

"The message is: 'The K's tour with one call only upon each square has long been a source of fun for chess fans when not able to visit their clubs. At first it may seem hard by any route at all, but when a way is found by one whose maths is good, 'The' is 1 and '260' is 64, and all eight files will total 260."



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## SENIOR SYSTEMS ANALYST

A well-established manufacturing organisation, part of an international group, wish to appoint a Senior Analyst to head the systems team in their data processing department.

Applications are invited from candidates able to offer a solid industrial background including two years in system O&M related positions together with some supervisory experience.

The company's computing facilities are based on large IBM mainframes under OS, accessed via a Data 100 link. There are several areas which will benefit from more advanced computer systems, in particular the production and sales departments. The person appointed will become immediately involved in development projects for these areas.

In addition to a very competitive salary the company are able to offer comprehensive benefits which include a pension scheme, free BUPA and a monthly productivity bonus. Expenses to cover relocation are also available.

Ref E1/2707

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## CAN YOU SELL TO MANAGEMENT?

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## COMPUTER PERIPHERALS?

Initial earnings circa £8,000 per annum plus Company Car. Target earnings circa £9,800 per annum with no upper limit.

DATA DYNAMICS LIMITED, a well established, British-owned Computer Personnel Company, is expanding rapidly, therefore talented and ambitious Salesmen are required to sell a variety of products.

Presently we require two Sales Executives one of which should have experience in this market, preferably in VDU's, Printers, Magnetic Cassettes or Floppy Disks. We are willing to train the second Salesman who should have a strong general sales background. A guaranteed commission will be paid during training.

If you have successfully sold VDU's, Printers, Floppy Disks and Cassettes or have a strong general sales background please contact:

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UK Sales Manager  
DATA DYNAMICS LIMITED  
Data House  
Springfield Road  
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Salary £6345 to £6887 p.a. inclusive, plus car allowance up to £210 p.a. and mileage up to 10.8p per mile.

We are joint users of an IBM 378/145 computer installation. The Computer Division is expanding into telecommunications and a property data base is established.

We require an independent specialist to spearhead a new approach into computer audit. In an advisory and supervisory capacity to the Internal Audit Division of both Brent and Ealing. The scope of the post will be wide and will cover controls of all systems, interrogations and use of test packs, operating controls, prevention of possible error, security of hardware and software and methods of safeguarding privacy and security of information.

Applicants should be senior systems analysts with experience of programming (preferably in Assembler and COBOL) and members of the British Computer Society or equivalently qualified. Every opportunity will be afforded to fulfil the postholder's ongoing training needs. Generous relocation expenses are available. 35 hour week. Flexible working hours may be introduced. Subsidised staff canteen at Brent and Ealing.

Application forms and job descriptions from the Administration Manager, Room 708, Brent House, High Road, Wembley, Middlesex, returnable 3rd August, 1978. Telephone 01-803 9371 (24-hour Answerphone service). Reference number F/48/D must be quoted.

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We are seeking programmers with at least two of the following languages:

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IBM 370  
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A knowledge of Dutch or French would be advantageous.

Contact: Su Saint Office — (01) 828 6834  
eves./weekends — (01) 274 1923

**GEMINI COMPUTER  
SYSTEMS LTD.**  
Gillingham House  
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Ascii through the  
Logic Gate

An epic in 32K words, by Richard Forsyth

## Block 8 (Block Mode Transfer)

Hex and Cleo have slipped into the research centre at San Guine, persuaded Lumbdu and Zap to work with them and slipped out again unobserved. At the hush where their getaway motorbike is hidden, however, they are confronted by its irate rightful owner, with two law enforcement robots.

HEX took one look at the armed robots. "We surrender," he said. "Don't shoot." He didn't want Asci to make a suicidal attempt at resistance; but Asci had already disappeared into the thicket.

"Come with us," commanded James Hock. They followed him to the main gate. There a sentry challenged him.

"I have come to turn these criminals over to your security service," said Hock. "They stole my motorcycle. The girl is a human and I suspect the android is some sort of drop-out."

Before the guard could reply an imposing figure strode towards them. It was Zap. "Mr Hock, I presume," he said. "I understand you've had some trouble with these two renegades."

"Quite so," replied Hock. "They assaulted me and left me by the roadside. I want to report them to your security officer."

"I am acting chief security officer," said Zap, flourishing his ID-card authoritatively. "I'll take charge of them personally. These are not just common thieves; they are suspected of belonging to the Hexadecimal Kid's terrorist gang. You may not be aware that a substantial reward is on offer for information leading to their arrest. The System will be indebted to you."

Hock beamed. "I'm not called Add Hock for nothing."

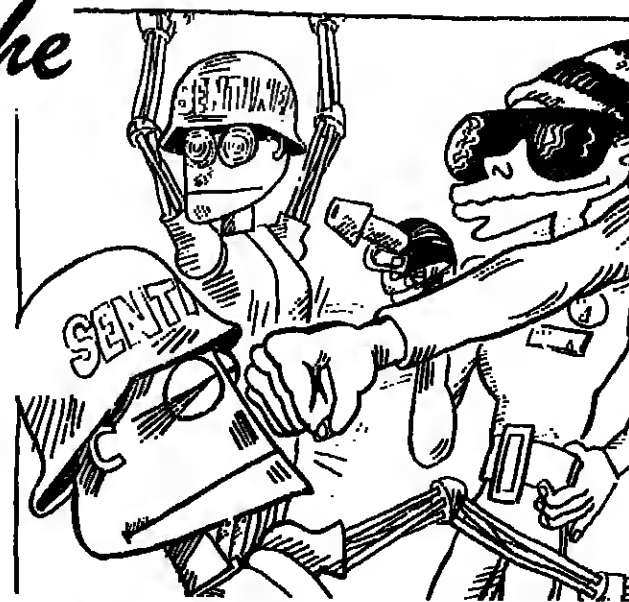
"What are you called Add Hock for?" Inquired Cleo.

"Because I can put two and two together, stupid," he retorted.

Cleo decided no further comment was necessary.

"Now," put in Zap, "I'm afraid we'll have to take the motorbike in for forensic tests. You can, of course, stay here, at least until some transport can be arranged."

"That's very hospitable," replied Hock. "As it happens I was on my way to give a demonstration of my word-processing package to your software manager, but as these



hooligans tore up my source listings I'll need a while to make it presentable again."

"Fine, then, just follow me," said Zap, and added to the law enforcement robots: "You can go now, thank you, we'll handle this ourselves."

Hex hardly dared sneak a glance over his shoulder to see if they had obeyed Zap's order. Sure enough, there they were, trotting obediently into the distance.

Once inside the main building Zap put his arm round Hock's shoulder and began chatting expansively about the virtues of the PUFFA system, about which he appeared quite well informed. They quickly reached Floor D and made their way to what Hex seemed to recall was Lambda's door. Zap unlocked it and ushered him in. "This is your overnight accommodation. I hope you find it comfortable. If you need anything, just request it on the viewdata terminal. Now excuse me for a moment; I must deliver these two to the basement cells for interrogation." He bade Hock goodnight and shut the door.

"Easy does it," whispered Zap as they walked back to the lift.

Lambda was waiting for them in the foyer. All four of them marched out together. Hex noticed that Zap had unfastened his holster and drawn out a terminator, which he brandished menacingly in Hex's direction.

"Any trouble from you?" he called out loud enough for the sentries to hear as they approached the gate, "and you'll both get zapped."

"That's just it," said Hex. "Cleo persuaded me to leave early. They obviously haven't got her on file."

"And they obviously didn't expect an android to change his plans for a mere human," replied Zap with a mischievous smile.

"I hope she gets back soon," was Hex's response.

Were they wise to leave Cleo and Lambda to fend for themselves? No.

Both guards stood out to check their progress. "Orders to take these prisoners to Galactic Headquarters," explained Zap, preempting their questions. "My orders," replied Zap, pointing his terminator directly at the questioners.

The other sentry moved fast, but not as fast as Hex who grabbed his blast-gun and stuck five digits in its interface before he could fire. Seeing this, the first one dropped his blaster and raised his hands in the air. They hustled him through the gateway.

"Where's the hike?" asked Zap.

"Follow me," replied Hex.

When they got there, Asci, who had eluded Hock's searchlight and laid low since their capture, was still waiting. They tied up the sentry and put Cleo and Lambda on the motorcycle.

"We'll go on foot," said Hex, "and meet you at the inter-block gap. Take care."

"See you soon," called Cleo as the machine spluttered into motion.

Hex, Zap and Asci jogged cross-country through the night. They hadn't much time, or breath, for conversation, but in the middle of the night Zap asked, "Do you think they let us get away?" to which Hex had no reply. Reflecting on it, though, he did think it had gone just a bit too easily.

By morning they were high up once more in the Sierra Nueva. They arrived before the girls and Hex led Zap down the secret tunnel. The last few metres, however, were blocked by an earthfall. Asci dug, while Hex and Zap ferried stones laboriously up to the surface, to clear a passage. When they finally broke through, Hex was unprepared for what he saw.

The carpet of green moss had turned red; the tree by what had been the pond was just a charred black stump like an outside nutstick, and the pool itself was no more than a muddy brown puddle. Hex turned to Zap. "This place has been bombed while we were away."

Zap glanced at the rock walls of the crater which were glazed like porcelain, confirming Hex's surmise. "They must have used psycho-logic to predict your movements. There's enough data on you in the Database for them to work out an extrapolation formula. The only question is: why were they late?"

"That's just it," said Hex. "Cleo persuaded me to leave early. They obviously haven't got her on file."

"And they obviously didn't expect an android to change his plans for a mere human," replied Zap with a mischievous smile.

"I hope she gets back soon," was Hex's response.

Were they wise to leave Cleo and Lambda to fend for themselves? No.

1078, Richard Forsyth, RAJR Timeshare.

## BOOKS

Entertaining writing  
about computers

Tales from the computer room, by John Race. 44pp. 60p plus 10p post and packing. Brunel University Bookshop, Kingston Lane, Hillingdon, Tel: Uxbridge (89) 37188.

There is a maxim in the film industry that you can't make a bad film that involves a train. If it is a thriller it will be exciting and if it is a comedy it will be funny. There is something about trains that catches people's imagination.

There is something about computers, however, that does not. Several films and television plays have been made centring around computers and they have never, it seems to me, rung true.

The function they perform is obscure, while it is obvious what the use of a train is. In carrying people from A to B. The workings of computers are totally hidden inside, making them seem impenetrable and devoid of personality. Unlike the train, which is a mechanical beast, the computer is a living creature.

This lack of human interest makes them a bad subject for any art. The few films and television plays that have been made about computers are not only boring but also misleading.

John Race's book is a collection of short stories and anecdotes about computers. It is a book that is both entertaining and informative.

succeeded in producing moving and entertaining writing based around computers, and this is what John Race has done with his slim volume of stories and poems entitled, Tales from the computer room.

Race is a lecturer at Brunel University with a broadness of interest and artistic sensitivity sadly rare in the computer world. The pieces in his book range from highly intellectual wit to satire, to pathos, and all equally ingenious and effective. There is science fiction, crime, the occult, burlesques of Cheaterport and of Saki, a Petrarchian sonnet.

There is a story of an In-ter-dicting robot that keeps pointing out the logical inconsistencies in the way its owners run their lives, and a remark of their's: "I'm carrying people from A to B. The workings of computers are totally hidden inside, making them seem impenetrable and devoid of personality. Unlike the train, which is a mechanical beast, the computer is a living creature."

One particularly poignant piece is a monologue by a man who is a computer programmer. He is a man who is a computer programmer. He is a man who is a computer programmer.

PL/I has been likened to a Swiss Army knife with 100 blades. — there is unquestionably a blade for whatever you might want to do, but there is some risk that in using one blade you will cut yourself with another.

This book introduces disciplined, well-structured,

and certainly different. There is some nicely-toured, subtle observation slipped in, such as in a description of some new programmers: "rather odd-looking characters without beards".

One sample cannot do justice to the book, but I think you should have some sort of taste of it: FEMININE INTUITION. Men think we are not blessed with souls. Are useful, yes, for drudgery and helping them attain their goals. (Ours to them, a boring

We can read, this they accept. Can work out sums, and write a bit. Store - stuff, remember where it's kept. And, fetch it, when a man wants it.

We're tired of condescension, tired of being Adam's latest rib (Women, the first, rather misfired). We've had enough. Computer Lib!

RORY JOHNSTON

A primer on disciplined programming using PL/I, PL/CS and PL/CT, by Richard Conway. 419 pp. Winthrop Publishers Inc, 7 Dunster Street, Cambridge, Massachusetts, USA, 02138.

programming based on the use of three compilers designed to save you from the death of 1,000 cuts.

PL/CS is an instructional dialect of PL/I, widely used in the US. Some PL/I features are omitted for simplicity and some diagnostic facilities not present in PL/I are included. The PL/CS compiler is claimed to be more efficient for short programs and very much more tolerant of programmer errors.

PL/CS is a new, disciplined, well-structured,

mytery). We can read, this they accept. Can work out sums, and write a bit. Store - stuff, remember where it's kept. And, fetch it, when a man wants it.

We're tired of condescension, tired of being Adam's latest rib (Women, the first, rather misfired). We've had enough. Computer Lib!

RORY JOHNSTON

compiler based upon PL/CS but imposing more restrictions on the programmer; to enforce good programming practices and develop habits that will be continued when the programmer graduates to PL/I.

In PL/CS there is a shift of emphasis to the prevention of logical errors rather than the 'repel' of syntactical errors as in PL/I.

PL/CT is an 'interactive' version of PL/CS. An interactive version of PL/CS is also planned.

All three compilers have been developed by the de-

## Brochure

THE names and addresses of most suppliers of microfilm equipment in the UK and descriptions of their products are included in a booklet now available from the Business Equipment Trade Association.

The first 20 pages of the booklet are devoted to explaining what microfilm is, various types of microfilm format, photographic processes, indexing and retrieval methods, staff training and the legal aspects of microfilm. There is also a section which presents the potential user with a checklist of points to be considered before implementing a microfilm system.

An introduction to microfilm, 100pp, £4. Business Equipment Trade Association, 108 Kingsway, London WC2.

Dr. Adrian Stokes of Longton Information Systems describes "The design of future telecommunications". There is a glimpse in some detail the PO's present facilities and future plans.

Nigel Laurie of Communications Audit makes the point that the right man-machine relationship improves user performance. The spelling, punctuation and general editing of the book unfortunately leave something to be desired.

Spreading  
the message

Data communications: spreading the message, edited by Alan Simpson. 120pp, £9.95. Input Two-Nine Ltd, 7 Bensted Road, Purley, CR2 3ER.

COMMUNICATIONS is the subject of the latest book in the series "Current aspects of computer technology" published by Input Two-Nine. Entitled "Data communications: spreading the message", the book contains articles by a range of well-known names in the industry giving their views of current and further communications technology.

In the State of the Art section, John McNulty of

Modular Technology gives a characteristically punchy critique of the Post Office Monopoly.

Dr. Adrian Stokes of Longton Information Systems describes "The design of future telecommunications". There is a glimpse in some detail the PO's present facilities and future plans.

Nigel Laurie of Communications Audit makes the point that the right man-machine relationship improves user performance. The spelling, punctuation and general editing of the book unfortunately leave something to be desired.

Obviously, the book's appeal is mainly directed to those with access to a Cornell compiler but it may also be of general interest to PL/I enthusiasts and compiler writers.

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PAIN, REPLY

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